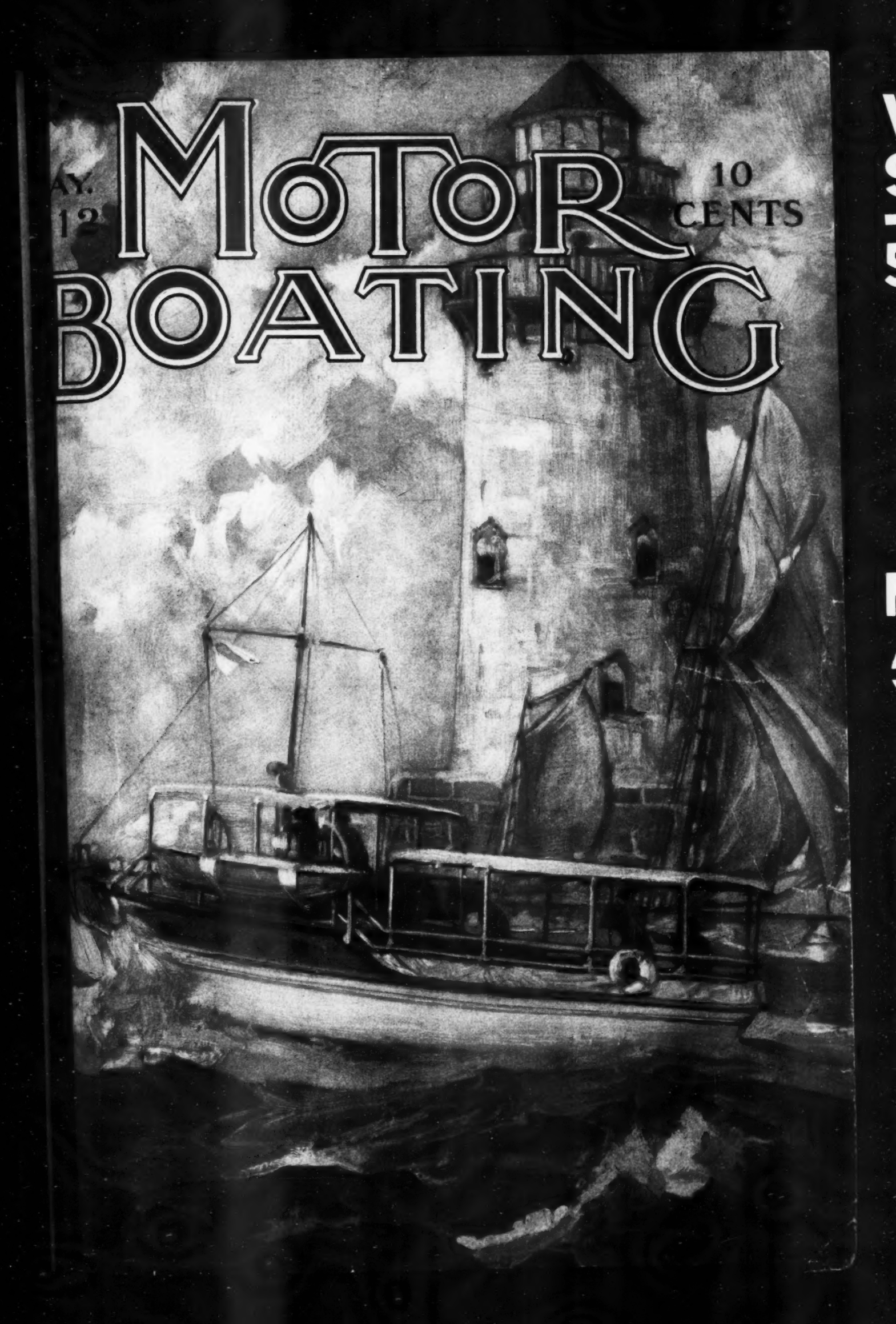
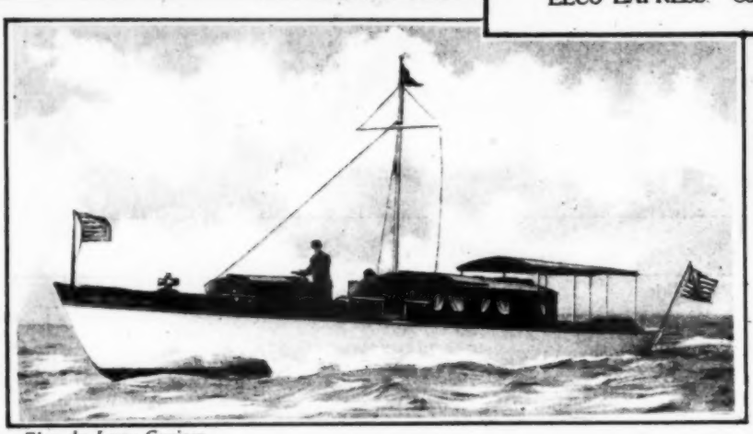

MAY. 12
MOTOR BOATING
10 CENTS

Elco MOTOR BOATS

"You'll always be proud of your Elco"

RELIABILITY · PERFECTION · ULTIMATE ECONOMY

ELCO EXPRESS. Comfort—Reliability and Twenty-four Miles Guaranteed



Elco-de Luxe Cruiser

Stock Boats for Immediate Delivery

Elco Express Launches

28-ft. 4-cyl. Engine. Guaranteed Speed 20 miles.
35-ft. 6-cyl. Engine. Guaranteed Speed 24 miles.

Elco-Planes of the "Bug" Type

(Patent applied for)

16-ft. 4-cyl. Engine. Guaranteed Speed 30 miles.
20-ft. 6-cyl. Engine. Guaranteed Speed 35 miles.

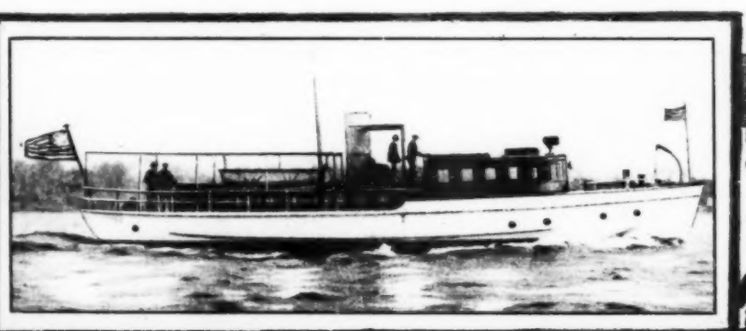
36-ft. Elco Popular Priced Cruiser.
54-ft. Elco de Luxe Cruiser.

ELCO speeds GUARANTEED, or sale can be cancelled.
ELCO boats and engines GUARANTEED for one year.

Write for New Catalogue

Address Elco 201 *Avenue A,*
Bayonne, N. J.

27 minutes from Liberty and 23rd Street Ferries.
C. R. R. of N. J. to W. 8th St.



ENDURANCE!

It is after each abuse—and abuse it you must at times—that your STANDARD wins your fullest appreciation. Your STANDARD is as long-lived as your boat and your respect for it grows.

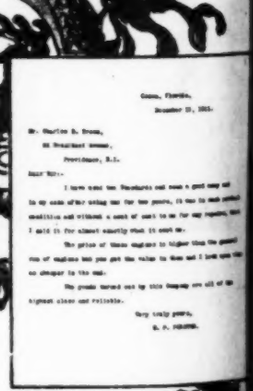
Design of the simplest—workmanship of the best—materials of tried value—all go toward producing an engine which runs so smoothly that shocks are reduced to a minimum.

The water circulation must be so positive that the right temperature is maintained in all parts, always; the lubrication so efficient that no part gets too much or too little oil at any time. Materials must be those that best withstand the destroying influences to which they are subjected.

An engine to be serviceable must have been out of the experimental stage for a long time. It is only after actual service that many things are learned, absolutely impossible to learn in any other way.

You who purchase the latest STANDARD model receive far greater value than did the pioneer STANDARD owner. However, pioneer STANDARDS are still doing hard work easily and well.

Our treatise catalogue is not a price-list, but a book full of technical information, illustrated with pictures of many famous yachts. Write for it to-day. If interested in prices ask for them, too. Back of the STANDARD guarantee is the



Gross, Florida,
December 21, 1911.

Mr. Charles D. Dunn,
46 Woodbine Avenue,
Providence, R.I.

Dear Sir:-

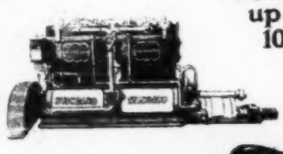
I have used two Standards and want a good word for it in my case after being out for two years, it was in good condition and without a cent of cost to me for any repairs, that I said it for almost exactly what it cost me.

The price of these engines is higher than the general run of engines but you get the value in them and I look upon them as cheaper in the end.

My goods turned out up this Company are all of the highest class and reliable.

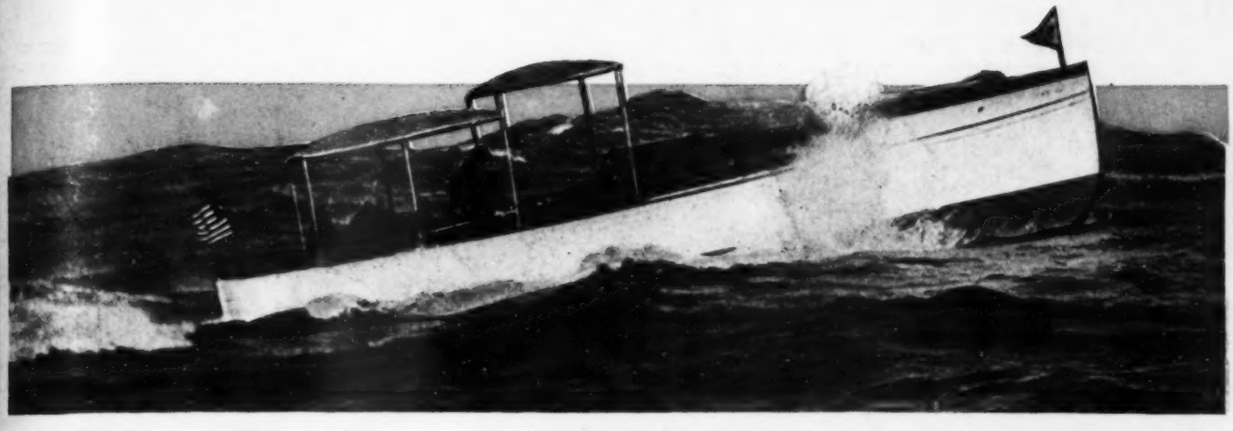
Very truly yours,
A. F. [illegible]

"Power up to 1000"



STANDARD MOTOR CONSTRUCTION CO.

178 WHITON STREET **JERSEY CITY, N. J.**



CONTENTS

MAY, 1912

Neck and Neck.....Frontispiece
The St. Augustine Regatta..... 3
In the Clutches of Helen B.....*Bradford Burnham.* 6
Up-to-Date Practice in Bulkhead Control.*C. F. Chapman.* 8
Hydro-Aeroplanes at Monaco (Photographs)..... 10
An Ocean Cruise in a Motor Canoe....*George S. Goldie.* 11
The Regatta at Cambridge..... 13
Dead Reckoning.....*Wm. C. Ward.* 14
How To Design a Motor Boat.....*L. B. Chapman.* 17
The Annual Meet at Monaco.....*Robert Fletcher.* 20
Viking—A Conversion..... 22
How To Build a Hydro-Runabout....*Frederick K. Lord.* 24
The Classification of Speed Boats.....*H. T. Koerner.* 26
Among the Clubs..... 27
Government Requirements for Motor Boats..... 29
Tide Table for May..... 29
New Things for Motor Boatmen.....30-32
The Prize Contest.....33-39
Making a Watertight Hatch..... 33
The Dual vs. The Double System..... 36
The Why and How of Storm Oil..... 37
A Submarine Pleasure Craft..... 39
New Motor Boat Designs..... 40-48
A Forty-Footer..... 40
Another V-Bottom Runabout..... 41
A 75-Foot High-Speed Cruiser..... 42
Dido, A 65-Foot Cruising Yacht..... 43
A Raised-Deck 33-Footer..... 44
A 38-Foot Cruiser..... 45
A 96-Foot Cruiser for Southern Service..... 46
A 30-Foot Stock Model..... 47
Lillian S, a 40-Footer..... 48
Yard & Shop.....49-52

Cover Design painted by Todahl.

The remarkable rough sea picture at the top of this page shows the trim forty-foot cruiser, Lornina, designed by William H. Hand, Jr., of New Bedford, for W. Lyman Underwood.

The National Magazine of Motor Boating

May, 1912, Vol. IX. No. 5.

MOTOR BOATING

Entered as second-class matter at New York, N. Y., Post Office.

Copyright, 1912, by MoToR BoatinG

Published Monthly by NEW PUBLICATION COMPANY, 381 FOURTH AVENUE, NEW YORK CITY

G. L. Willson, President — George von Utassy, Treasurer — C. J. Shearn, Secretary

Telephone: 7100 Madison Square — Cable Address: Motoria

10 *cents a copy.* *Subscription,* $1.00 *a year.* — European Agents: Saarbach's News Exchange, Mainz, Germany

Photograph by Rosenfeld.

Neck and Neck—Two Reliance runabouts in a brush on the Harlem River.

MOTOR BOATING

THE NATIONAL MAGAZINE OF MOTOR BOATING

The Racing at St. Augustine.

How Jane S., a Florida Boat, Won the Southern Championship Held by Vita, at the Season's First Regatta.

Photographs by W. J. Harris.

The St. Augustine Meet this year took the place of the Palm Beach Regatta of past years as the "curtain raiser" of the season's racing, and while no records were broken at this meet, the attendance and enthusiasm of both the contestants and the spectators speak well for the success of the racing season of 1912.—Editor.

SPARKLING white spray began flying in earnest from the bows of the speedy fellows of another season when the blue waters of Matanzas Bay off St. Augustine, Florida, were streaked with white by the contestants in the annual race meet for the Southern Championships. The Florida races provide our first real horoscope of the season, outside the shop, and we know that an especially enthusiastic and successful outcome of this pioneer gathering of motor boats portends a prosperous season in Northern waters later on.

A fair representation of yachts rested at anchor near the course on the opening day, Wednesday, April 3d, while the piers and sea wall were tightly packed with spectators. Thanks to a wise committee the course, a 2½-mile circuit, was laid out in such a way that the entire circuit was easily within the view of those on shore, and the boats were never out of sight of the spectators at any stage of the events. The popularity of such a course is readily understood, and let us hope and pray that some such means may be provided for the Internationals of 1912, so that the "fan" who owns neither a yacht nor a telescope can get at least one nearby glimpse of what's going on from his perch on the bleachers.

Vita, Jr., the tiny new prodigy of Commodore Blackton's, won the first race of five miles, in which there were four entries, her time being 18m. 1s. Vita, Jr., was built during the winter by the Reliance Motor Boat Co. and received a try-out in the ice-cluttered Harlem shortly before her shipment south. Seventeen feet over-all, thirteen on the water line when at rest, at top speed this flying fish seems scarcely to touch the waves and in fact only about five feet of her length does. She is equipped with the well-known English Humber motor, of four cylinders, 4⅜ x 5 inches, and her rating is 53. Vita, Jr., "got there," and she will continue to "get there."

Vita, Mrs. Blackton's express tender, that won the Southern Championship in 1911.

The second race of the day was won by Seminole, owned by Mr. W. N. Snyder, of Oak Hill, Fla., the boat covering five miles in 14m. 26s. The third race, a ten-mile event, was won by Caroline II, Mr. Edward J. DuMee, of Ocean City, N. J., owner, with the well-known Vita, owned by Mrs. J. Stuart Blackton, second—and second by but one-half second. Caroline's time was 3m. 40½s., the finish being of the kind that thrills.

Honors for the fourth event of the day went to a Florida boat, Jane S., owned by Charles S. Smilie, of St. Lucie, Vita, Jr., this time suffering defeat. The fifth and final event of the day resulted in a dead heat between Adelaide, Mr. K. L. Ames, Jacksonville, owner, and the Blackton pair, Vita and Vita, Jr.

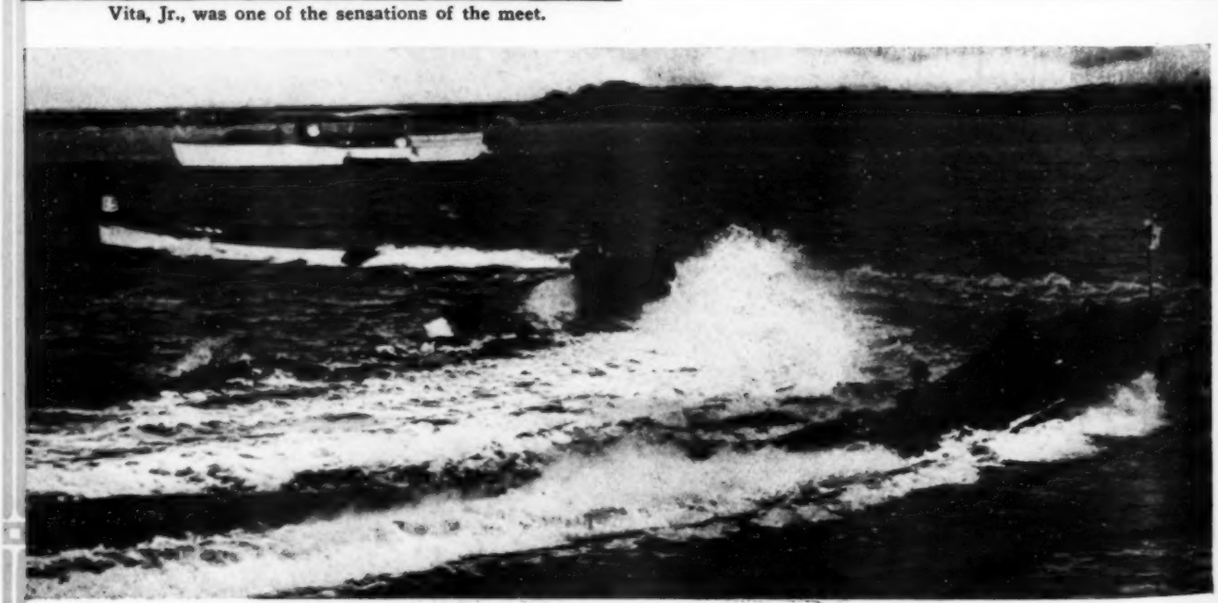
More varied events were the order of the second day. The breezy weather which marked the first day's racing continued to kick up a playful little sea, which disturbed the entrants not at all and gave the necessary zest for an enthusiastic gathering. Again the sea wall from Fort Marion to the bridge was peopled with interested spectators, while the pennants and ensigns from the yachts off shore fluttered gaily. The first event of the day, a five-mile affair for boats whose highest achievements had not reached 20 miles an hour, was won by Ram, a St. Augustine boat, owned by G. W. Corbett. Another St. Augustine boat, El Uno, the property of E. L. Calhoun, finished second.

Jane S. (in foreground), winner of the "Southern Championship," and Adelaide, another fast Southerner.

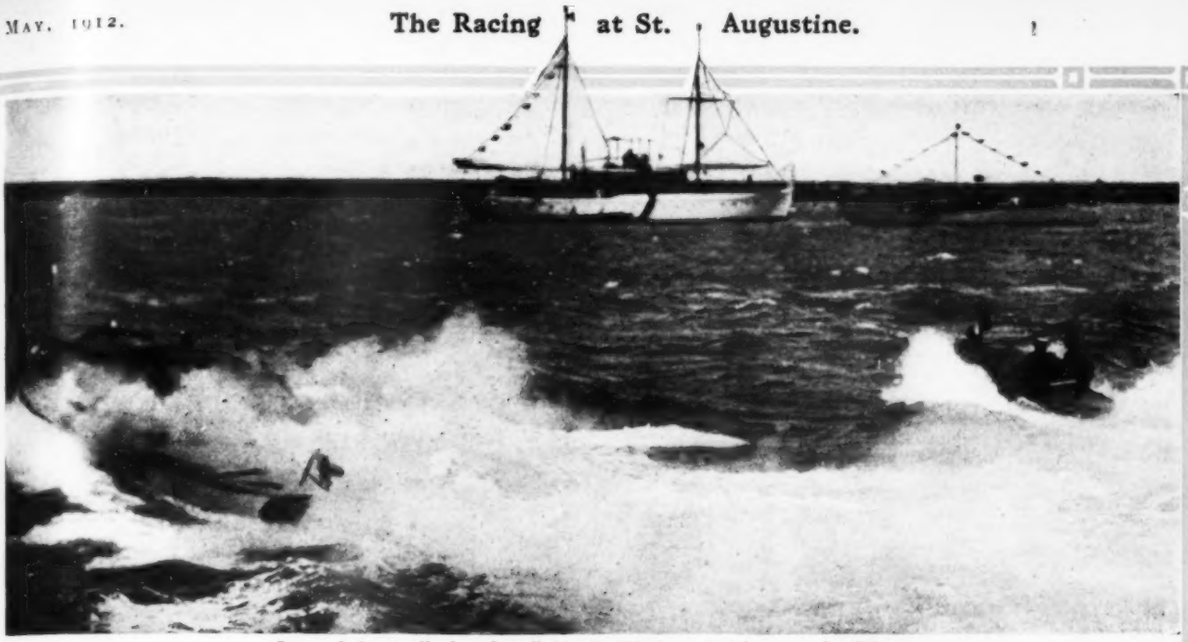
Vita, Jr., was one of the sensations of the meet.

Then came another forceful illustration of the absurdity of the outgrown American Power Boat Association rating rule, now tottering on the brink of a well-deserved fall into oblivion. It was another five-mile event, and the slowest boat entered had to allow the fastest boat a three-minute handicap. Only two of the four entrants stayed in, Caroline II winning over Vita. Still another five-mile event brought a victory to Adelaide, K. L. Ames' Jacksonville racer. Her corrected time was 16m. 3s., while Caroline II's was 16m. 30s.

Two 25 nautical miles events completed the racing for the day. There were four entrants in the first, limited to boats of over 25 miles per hour speed. Both first and second places went to boats from the Peninsular State: Diana, belonging to D. H. McMillan of Jacksonville, and Jane S., the St. Lucie racer of C. S. Smiley, winning the two places, respectively. A free-for-all handicap race of 25 miles brought out nine starters, all but one of whom finished. In this contest Vita gained the victory, with Jane S. second, and Adelaide third, the times (corrected) being respectively 1h. 17m. 50s., 1h. 18m. 41s., and 1h. 28m. 31s. A re-



Diana (the winner), Vita and Jane S. on the third turn of the 25-mile race.



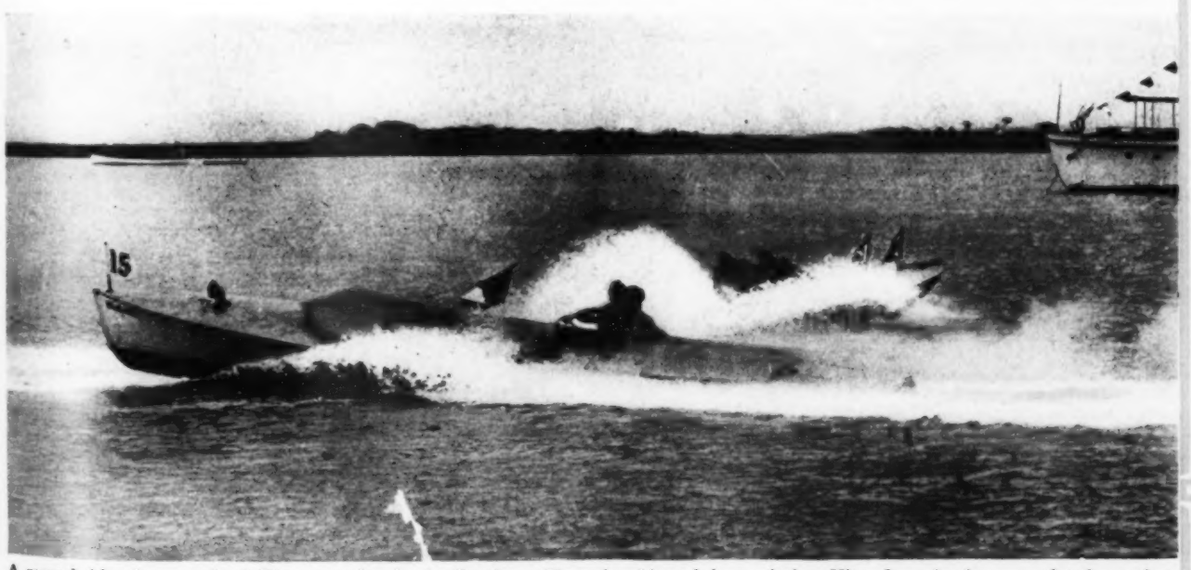
Start of the 5-mile free-for-all for the Blackton trophy, won by Diana.

ception of the kind Commodore Blackton's hospitality has made famous in motor boat circles was held that evening on his motor yacht Paula, when dancing and refreshments were enjoyed by some fifty guests.

On the final day of the meet the speedy Florida craft, Jane S., heaped laurel wreaths upon her shining bows and the neck of her owner, Charles S. Smiley, by winning the Southern championship race of one hundred miles, divided into two fifty-mile heats, one held in the morning and the other in the afternoon. In the morning race, Vita retired on the twelfth lap, owing to the loss of her rudder. Caroline II and Ruth K. also had to drop out before the end on account of engine troubles.

The successful meet culminated in a successful banquet the evening of the 5th, tendered by the St. Augustine Power Boat Club, at which prizes were awarded and congratulations exchanged. The regatta committee of the St. Augustine club served as judges during the meet, and much credit is due them for the way in which the various events were handled, with not a single protest and scarcely a muffled growl.

The popular Caroline II winning the A. P. B. A. 5-mile race.



A remarkable photograph of Diana starting in the Southern Championship and just missing Vita, Jr., who has completed one lap.

IN THE CLUTCHES of HELEN-B

BY
Bradford Burnham

SKETCHES
by
WILLIAM HARNDEN FOSTER

PART II

You have read the first installment of Helen B. and it is hardly necessary for us to say anything further by way of introduction. We are trying to give you cruising articles that are a little different and better than the matter of this kind that has already appeared; we are making an effort to let a little sunshine in, so to speak, and to keep away from the commonplace. If you like the kind of cruising articles that are appearing in MoToR BoatinG let us know about it; if not, tell us what you would like better.—Editor.

ALTHOUGH the sudden appearance of a fleet of submarines (that we had mistaken for more whales) in the usually peaceful precincts of Block Island Sound, was exciting enough to furnish conversation for a day, still more was to follow, for looking off to the ocean side of Block Island we saw a wonderful and impressive sight. Stretching off far into the dim distance, thirteen battleships, in perfect alignment, were coming up, their hulls and turrets standing out sharply against the horizon.

"Can it be that they take us for smugglers?" asked the skipper, excitedly, as he moved the throttle up another notch.

All doubt on that subject was soon dispelled by a glance ahead.

It was the day of the titanic battle between the two great fleets of Uncle Sam, the red and the blue. And we were caught squarely between the two fires! It was a run adventurous. How we escaped unscathed has remained a mystery to us ever since.

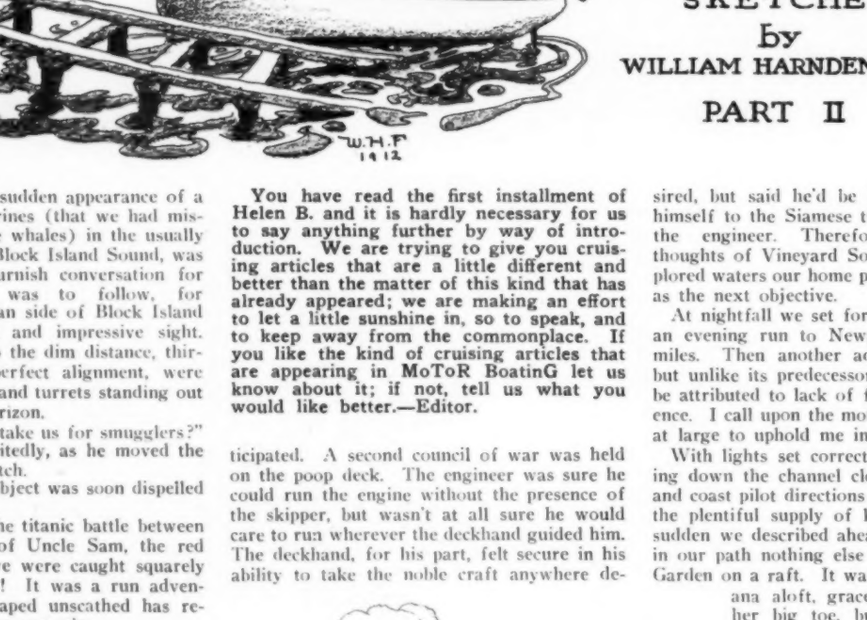
As the day was still young when we got inside Narragansett Bay we decided to keep on up to Providence as none of us had been over the waters of Rhode Island's fine stretches of protected water. With the help of the charts we navigated the west passage without interruption, and chugged up the Providence River without mishap. Turning aside at the first "Boats Hauled Out" sign, we poured forth the tale of Helen's absorbing proclivities into the sympathizing ear of the repairman, in whose eye dangerously gleamed the business instinct. We knew that we were to be the subjects of merciless fleecing, but we thought of the accursed pumps and humbly submitted. A creaky ride on the marine railroad's cradle followed, then the packing of a stuffing-box, the injection of some cotton in a seam or two, by a colored gentleman, and back into the river slid Helen. Needless to say, she leaked as badly as ever, though lightened by a considerable weight of hard cash.

At about this time the skipper received word that his presence would be desired back in Manhattan somewhat earlier than he had anticipated. A second council of war was held on the poop deck. The engineer was sure he could run the engine without the presence of the skipper, but wasn't at all sure he would care to run wherever the deckhand guided him. The deckhand, for his part, felt secure in his ability to take the noble craft anywhere desired, but said he'd be hanged if he'd trust himself to the Siamese twins in the hands of the engineer. Therefore, with regretful thoughts of Vineyard Sound and other unexplored waters our home port was decided upon as the next objective.

At nightfall we set forth intending to make an evening run to Newport. We got three miles. Then another adventure assailed us, but unlike its predecessors this one could not be attributed to lack of foresight or inexperience. I call upon the motor boating fraternity at large to uphold me in this statement.

With lights set correctly we were proceeding down the channel closely following chart and coast pilot directions and easily guided by the plentiful supply of lights, when all of a sudden we described ahead of us and directly in our path nothing else but Madison Square Garden on a raft. It was too dark to see Diana aloft, gracefully pirouetting on her big toe, but the bold outlines were brilliantly illuminated, while from within arose a sound like that of Helen's reverse gears intensified a thousand fold. Then a sign was made out which showed us we were all wrong and that it was the property of the Coast Dredging Co., of Norfolk, Va.

It seemed to be a case of heads or tails which side of it we should go. We elected the wrong one, of course, though I defy Christopher Columbus and the captain of the Olympic to tell how we were to know that, *then*. When nearly abeam of the mighty obstruction and about two hundred feet to starboard of it, two enormous cables like those which hold up Brooklyn Bridge, swam within the ken of the helmsman. Full speed astern was ordered but, though the engineer responded splendidly, it was too late—the cables swept our cabin roof, removing such trifles as a pair of sidelights as a tornado whisks off the roof of a house. The skipper's vocabulary seemed suddenly restricted to but one phrase, oft repeated. It is the same as that which springs spontaneously to the lips of the motorist at the sound of the explosion of his last tire.



Every no
and then he would rest and glance wistfully at Helen.

The episode might have resulted far worse. As it was we merely lost the sidelights and a few dollars' worth of postage stamps affixed to communications addressed to the various government bureaus in Washington, each of which in turn referred us to another till we decided the whole thing was a cooked-up scheme to give the post office the much-desired surplus.

We groped our way shorewards to await the dawn. Having seen what Providence could do we thought it best not to tempt Providence further.

Daylight and the continuance of the eventful run to Newport brought further troubles. The engine all of a sudden came to a quiet and pacific rest, as though weary of its labors. This time there was nobody to blame but the skipper. We could hardly expect the twins to run without gasoline. We had tried water and knew that wouldn't work. We had but an inappreciable amount of kerosene. (A hot engine, you know, will run for a while on kerosene in an emergency.)

A chart consultation revealed the depressing fact that Bristol was the nearest town, and that it was a good five miles away. With weariness of mind and body unlooked for in one so young, the skipper climbed into the tender and with slow, sluggish strokes, began to propel it Bristolward. Every now and then he would rest and glance wistfully back at Helen, not to see if she was still there, but to find out if the engineer had obtained help from some passing friend. When almost out of sight his heart was made glad by the sight of a fishing boat making its way toward Helen. After an enormously long wait his eyes beheld puffs of steam from the exhaust and slowly, very slowly, the ill-fated tub approached. But alas! Just as the row-boat was reached, she gasped and became quiescent again. Only a few cupfuls of the precious juice had been forthcoming from the fisherman. Another morning constitutional with the oars became necessary.

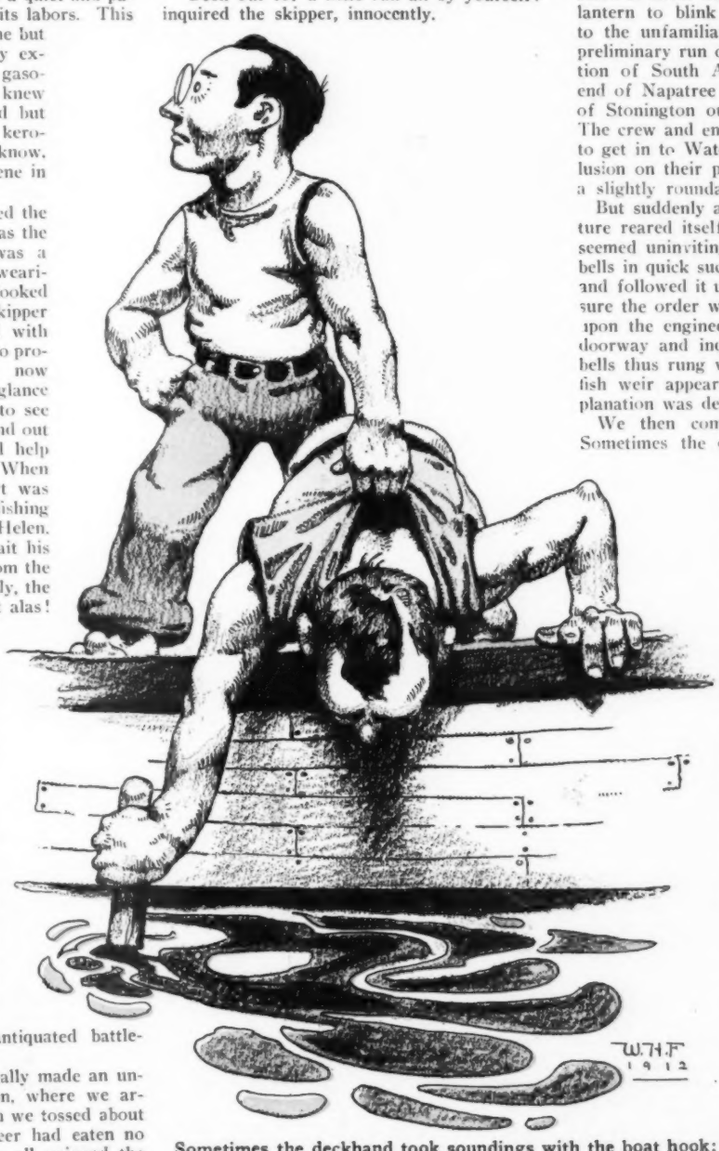
After ferrying out a five-gallon can of the stuff, Bristol was finally made and the tanks filled to overflowing. Then with nothing more eventful than an exceedingly sharp thunder squall to mark our way, we ran up into Newport's elegant harbor where we lay over night in company with a fleet of power yachts who looked askance upon our antiquated battlement of glass windows.

The following day we actually made an uneventful run to New London, where we arrived about noon. Off Judith we tossed about in fine shape, but the engineer had eaten no watermelon that day and we all enjoyed the zest-bringing weather. But that afternoon a grand climax on the part of Helen was in store for us. Apparently conscious of the fact that but little time remained to endow us with the lessons still undelivered, she turned on her rapid-fire guns and gave us broadside after broadside.

We decided to go down to Ocean Beach and have a shore dinner. We quietly made the short run and came to anchor off the end of the pier. Then, while the skipper and deckhand were in New London on an errand the engineer had a special private *tete-a-tete* with Helen. To guard against possible thievery one of the tender's oarlocks accompanied the skipper to New London. On returning, neither the tender, nor Helen, nor the engineer were at first in sight. The elopement would undoubtedly have been successful but for the fact that the skipper saw a white dot far out on the horizon which he thought might be the missing boat.

Suddenly it began to move, but in a truly wonderful manner. A remarkable zigzag course was maintained for a period with the ultimate result that the boat approached the dock. After a while we could see the athletic form of our engineer dashing wildly back and forth between the engine and the steering wheel. When some little distance off he tossed over the hook, clambered into the dink, and drew near the dock. In the bottom of the tender we descried a pyramid of oarlocks.

"Been out for a little run all by yourself?" inquired the skipper, innocently.



Sometimes the deckhand took soundings with the boat hook; more often the skipper took them with the keel.

An infinitely expressive snort was the only reply. No further explanation was forthcoming, till suddenly, when in the midst of our clam chowder at the shore dinner house, the engineer suddenly opened up with a sermon of tremendous power and eloquence. He chose a Biblical text: Ezekiel xxvii: 29-30; "They that handle the oar shall come down from their ships; they shall stand upon the land, and shall cause their voice to be heard over thee, and shall cry bitterly." The gist of his discourse was upon the advisability in the future of employing enough anchor line to prevent an incoming tide from lifting the anchor off bottom and leaving the boat at the mercy of the currents.

"And I had to borrow every confounded oarlock on the beach to find one that would fit;" he perorated, plaintively.

As we still had another day, we decided on an evening run to Watch Hill, the fact that our tanks were not quite full deterring us from seeking a more distant port. A fine but intensely dark night followed the memorable day. The numerous night aids in Fisher's Island Sound made the run to Stonington a snap. The engineer even steered a portion of the way.

But we couldn't seem to part company with Stonington and get into that maze of distortion known as Little Narragansett Bay, where there is never so much as a lowest class post lantern to blink forth its cheering guidance to the unfamiliar eye. The skipper made a preliminary run of a mile or two in the direction of South Africa, narrowly missing the end of Napatree Point and the unlighted end of Stonington outer breakwater in so doing. The crew and engineer thought he was trying to get in to Watch Hill but it was only a delusion on their part. It was a fine night for a slightly roundabout course.

But suddenly an enormous tennis net structure reared itself on high. To go through it seemed uninviting. So the skipper rang four bells in quick succession for full speed astern, and followed it up with several more to make sure the order would be understood. Whereupon the engineer appeared spectrally in the doorway and inquired profanely what twelve bells thus rung was intended to signify. The fish weir appeared undamaged after the explanation was delivered.

We then commenced to take soundings. Sometimes the deckhand took them with a boat-hook; more often the skipper took them with the keel. We made a minute study of the character of the bottom of Little Narragansett Bay. We found soft mud, sticky mud, sand, soft sedimentary rock, and once a rock of adamantine temper. Finally, after exhaustive tests, and one hundred and seventy-nine changes of speed, from full astern to "next to slowest ahead," we saw the outlines of the sleeping hotels on the summit of Watch Hill, and the next thing we knew it was morning and the voice of the little Watch Hill steamer's captain was edifying us with the information that we were directly in his course.

The final run to the home port of Helen Bilge was actually uneventful, and we left her a sadder boat and found ourselves a sadder and a wiser triumvirate of bum mariners.

Anticipation is, after all, a great thing. Sometimes it is even better than reminiscence. Already, we were anticipating the cruise we meant to take and didn't—a run through Vineyard and Nantucket sounds and around the cape. The canal will probably be completed before these anticipations become realizations, but we shall go 'round the cape just the same. Still, every once in a while, when the skipper, the engineer and the deckhand get together of an evening with the winds of winter howling outside, and the engineer's gigantic calabash smoking and smelling like the exhaust he came to know so well, we get out a greasy log book, and a few photos and wax exceeding reminiscent, and thank our stars that those self-same anticipations did not become realizations before we had endured the two weeks of unspeakable torture when we were all held fast in the invincible clutches of Helen B.

UP-TO-DATE PRACTICE

A Discussion of the Arrangement of the the Bulkhead of the Modern Runabout to Suggestions

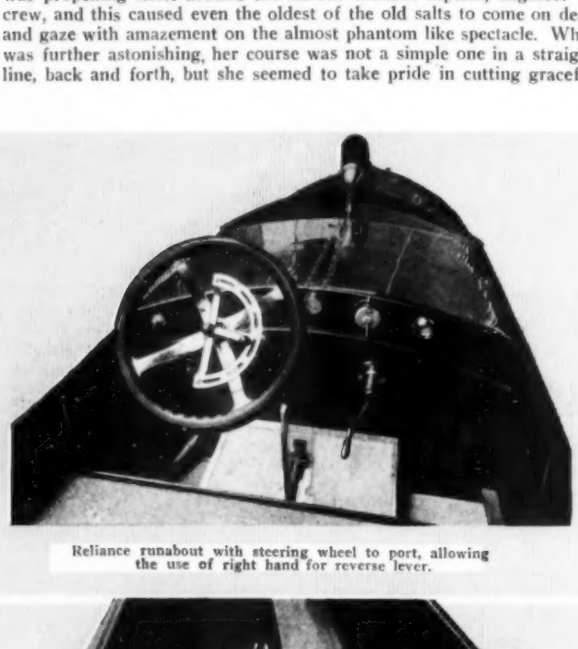
By Charles

ONE day last summer the residents of one of the older Massachusetts sea-port towns casually noticed a motor house boat slowly wending its way, back and forth, in and out, among the many small craft at anchor or under way near the mouth of the harbor. At first this created no particular attention but after the maneuvering continued for sometime with more or less clock-like regularity the inhabitants became a little curious and observed more closely. Further observation seemed to indicate that the craft was propelling itself around the harbor without captain, engineer or crew, and this caused even the oldest of the old salts to come on deck and gaze with amazement on the almost phantom like spectacle. What was further astonishing, her course was not a simple one in a straight line, back and forth, but she seemed to take pride in cutting graceful curves in and out among the boats anchored in the harbor.

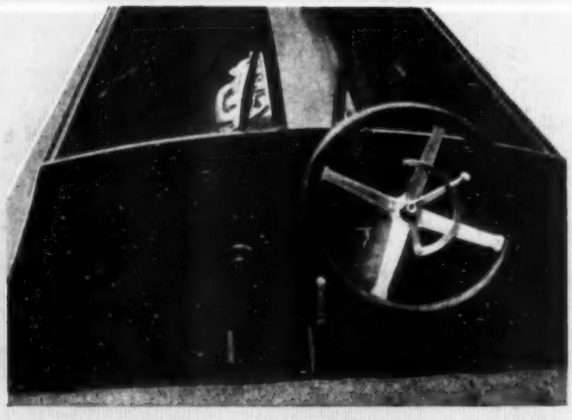
Investigation into the cause of the phenomenon revealed a group of men on the hillside, not far from the shore, operating a well-equipped wireless plant. The propelling power and steering equipment of the motor house boat had been fitted with delicate wireless apparatus whereby the entire operation of the boat could be controlled from the wireless station on the shore. While this was only an experiment to test the possibilities of guilding a torpedo by wireless, and not a demonstration of how the timid ones might derive all the benefits of motor boating while lying in their hammocks at their summer homes, yet it might be considered only a step further than the development of the method of controlling all the actions of the up-to-date motor boat.

It has been truthfully said that it is impossible to teach one to be skillful in the art of handling a sailing craft unless it is born in him, while on the other hand if almost anyone is placed aboard of a motor boat he will begin to observe at once and will learn all the finer points of handling the boat in a very short while. It will not require many lessons before he is as adept as his teacher. Probably nothing tends to bring about this condition so much as the centralization of all the controls directly in front of the operator, where he has everything within his easy reach and is able by a mere twist of his wrist or a slight motion of his foot to stop within a boat's length, should any occasion necessitate it; or should the engine require more oil or hard grease or the polarity of the dynamo be reversed it is equally easy to detect these faults and rectify them.

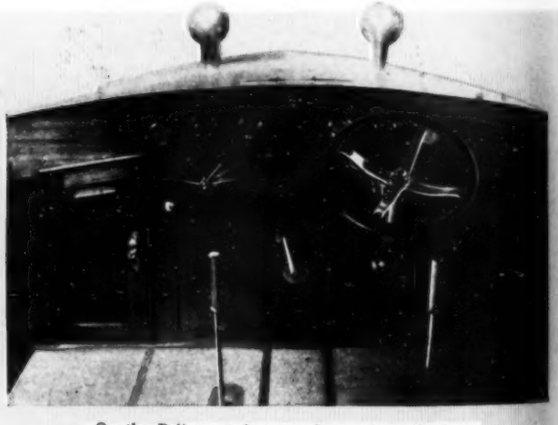
What is less appreciated by those who are contemplating their first boat or who have never themselves tried it, than to see a small



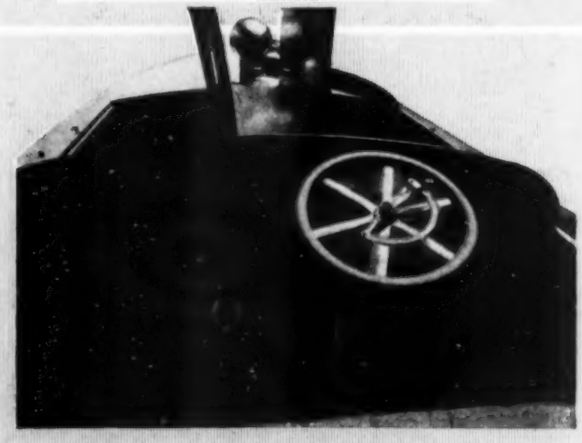
Reliance runabout with steering wheel to port, allowing the use of right hand for reverse lever.



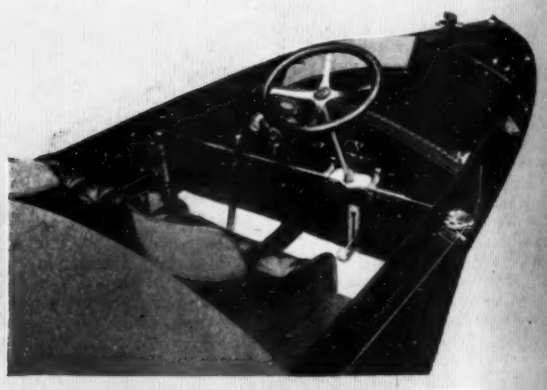
The simple bulkhead arrangement of one of the Atlantic launches.



On the Reliance twin-screw day cruiser, all the controls except the rear starter are in duplicate.



Simplicity is a characteristic feature of the bulkhead of Magnet, the Lawley runabout.



The arrangement of the 20-foot Elcoplane in which the motor is aft of the cockpit.

IN BULKHEAD CONTROL

Steering Apparatus and Motor Controls on Facilitate One Man Control — With Some and Criticisms.

F. Chapman.

boat, even though it be of the ancient variety of "horse-car type," approaching the float with one man at the wheel forward, vigorously giving signals on a tug-boat gong between his busy moments of putting the wheel, first hard over in one direction and then hard over in the opposite; another man at the engine amidships doing his best to keep the motor from alternately stalling and racing, as the next man further aft frantically jams the clutch forward or reverse, keeping in mind, if possible, the closeness of his knuckles to the coaming should he be a little absent minded when wielding the clutch handle, as well as the signals from the helmsman and the danger they will be in should he accidentaly stall the engine at the wrong moment, together with the advice from the rest of those on board and on the float. The remainder of the guests and crew are hanging over the sides ready to "fend off" and what is invariably the result? —Too many "cooks" and too much advice and the boat climbs half the length of her keel on to the float, a crowd collects and they look over the damage done.

Perhaps the skipper has learned his lesson and may do better next time, but the chances are strongly against it for even practice can not make perfect with this arrangement of plant, and try as hard as he may to avoid it, trouble will always develop at the least opportune time when property and perhaps life may be at stake.

The size of the craft need be no barrier to the centralization of the controls and the approach to the ideal one-man boat. I once saw a twin screw passenger lake steamer of some 150 feet in length equipped with two triple expansion engines controlled entirely from the pilot house without any assistance whatsoever from an engineer, in fact a fireman and oiler were her only below deck crew. The rapidity in which this steamer could make landings and get under way again was almost marvelous. The controlling and reversing of a steam engine is much more difficult to accomplish from a distant point than with most internal combustion engines.

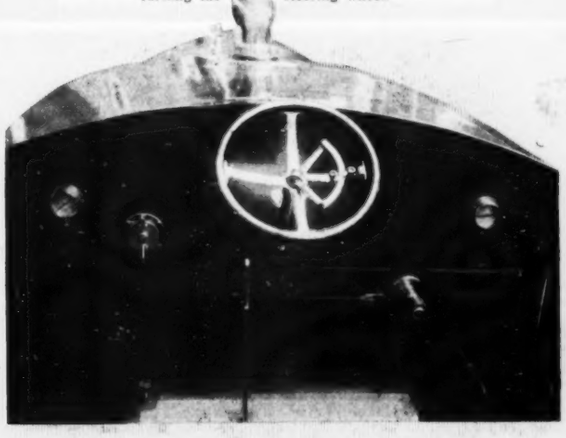
The modern "runabout" with its engine well forward and its bulkhead between the motor and the helmsman offers the greatest possibilities of arrangement for the various controls. However, the layout of the cruiser can be made equally as well adapted for a one-man boat by a little planning.

The accompanying photographs give an excellent idea of the range of bulkhead controls from the simplest on the small open boat, where only the engine throttle and steering wheel are associated together,

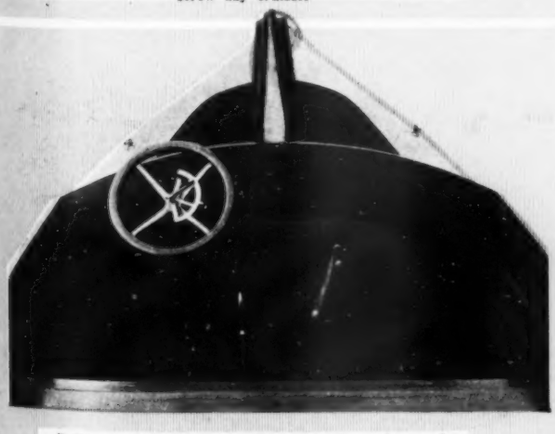
(*Continued on page 23*)

In the Hankscraft, the engine is started by merely turning the steering wheel.

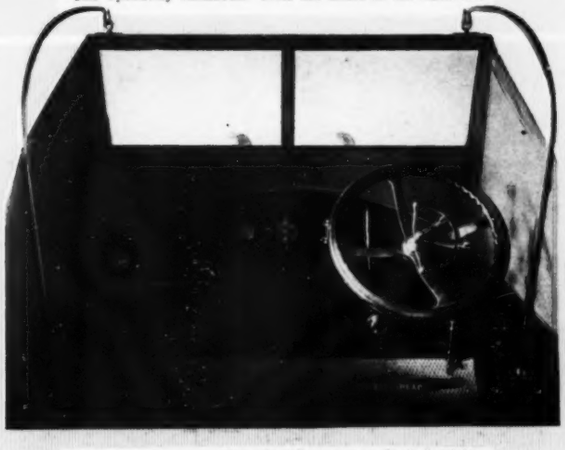
The elaborate duplicate controls of the Seabury twin-screw day cruiser.



The Speedway runabout. Note the doors in the bulkhead.



Bulkhead of one of the moderate priced runabouts of the Racine Boat Company.



The Elco Express. Note the trim spray and wind shield and the pedals for operating the clutch.

The Hydro-Aeroplane Meet at Monaco.

Great strides have been made lately in the development of the hydro-aeroplane and the results were evident at the recent meet held at Monaco. That there are possibilities in the principle was demonstrated by the way the machines negotiated the surf, as shown in the upper and lower photographs.

An Ocean Cruise in a MOTOR CANOE

Proving That Skill in Handling a Boat is More Important Than Its Type or Overall Length.

By George S. Goldie.

Whether or not you are one of those boatmen that delight in being out in rough weather and in doing stunts just for the fun of it and for the excitement and exhilaration that they afford, the chances are that you like to read about such things. Mr. Goldie, well known as the author of "From Novice to Pilot," is a motor boatman of wide experience. He likes to pit his own skill against the elements and he knows how to make the story interesting. This is the account of a trip he made in his motor canoe and it shows, what has been demonstrated so often before, that with skill on the part of the skipper, the seaworthiness of a boat is not necessarily a matter of size.—Editor.

ARISING from a bunk which had been shared by an old jib-boomer who regaled me with yarns until long after midnight, at four in the morning, I ate a lunch breakfast, then hurried to the canoe. She is one of the regular Indian model, open, canvas covered, and equipped with a two-cylinder Waterman motor of five horse-power. Its length is twenty feet; width on the gunwale, thirty-four inches; extreme width, thirty-six inches; depth amidship, fifteen inches, and for the run a temporary cover of ten-ounce duck had been spread over it. Stripping the midship section of its covering, I adjusted everything to its place, threw on the switch and cranked the motor. Yes! Cranked the motor!

It does not take long on a summer morning to start perspiration, to say nothing of profanity. When it started (the perspiration), as the canoe had not, I sat down to think. Upon getting puzzled by anything it has become a habit with me to try to think; not that I am always successful in thinking, but the effort is consoling. After a few moments of this I began to turn the wheel slowly, and watched. The motor had been thoroughly protected by canvas and it seemed impossible that any moisture could have collected on the plugs, yet they were watched as well as the rest of the machine. During one of the revolutions I caught sight of a tiny blue streak darting down one of the plugs. A soft piece of cotton cloth was given a twist about it and the plug polished, then the plug on the other cylinder; one twirl of the wheel and she was off so fast that I nearly went head first over the motor. In this manner I made my exit from Padanaram Cove, New Bedford, Mass.

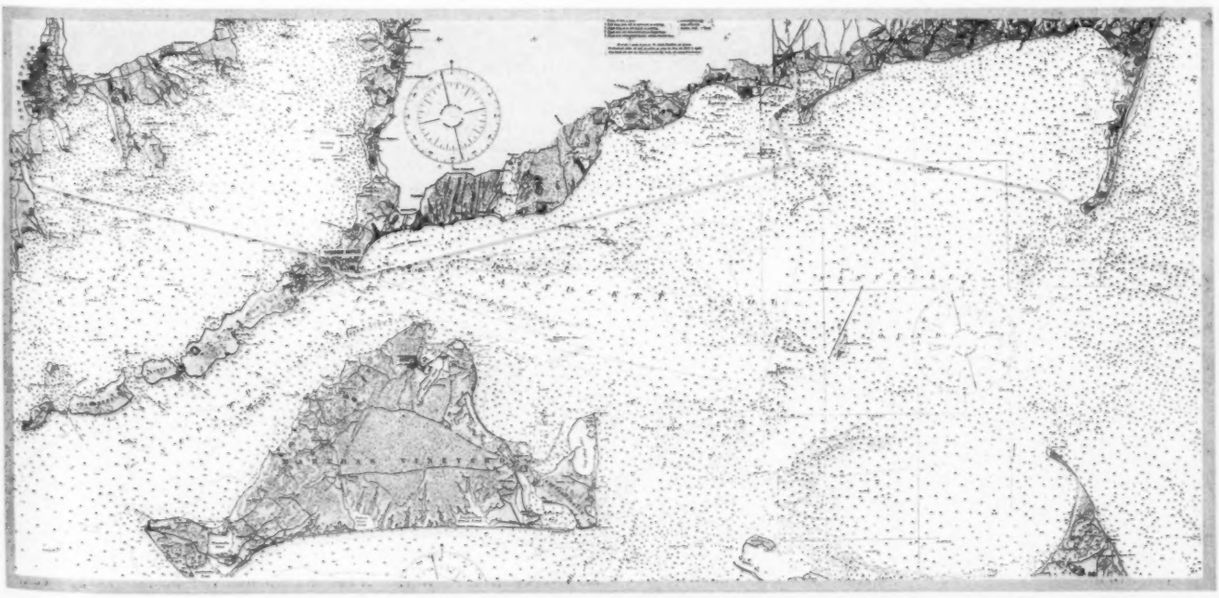
After clearing the entrance the next thing was to lay a course. Being bound for Woods Hole the course was, in a general way, to the S. E. Compass steering is exacting work at best, but in so quick an acting craft as a canoe it is not to be resorted to until necessary; therefore, it was that she was sent in a general way, S. E., this being continued until the Elizabeth Islands could be made out low on the horizon to the south. The distance to the Hole, which is a passage between the western end of Cape Cod and the eastern end of the Elizabeth Islands, having a nine-knot current, a four-foot rise of tide on its northern side, and a one and a half-foot tide on the southern side, was fifteen miles, leaving nothing but a watery plain between us. Keeping the cloud-like islands on the southern horizon well on the beam, the canoe speeding over the unruffled bay soon changed the land astern to a blue haze.

Our first diversion was the sighting of the masts of the ill-fated U. S. S. Yankee, as they stood erect as though she were afloat, well off on our starboard hand. Next was seen emerging from the dim line which was beginning to loom from the sea ahead, a low, faint column of smoke. On the water what may appear to be trifles often are important. Knowing it was very unlikely that any but the Nantucket steamer was off that part of the coast the smoke was a signboard that Woods Hole was ahead, and soon I had the satisfaction of seeing the steamer's hull rising over the sea.

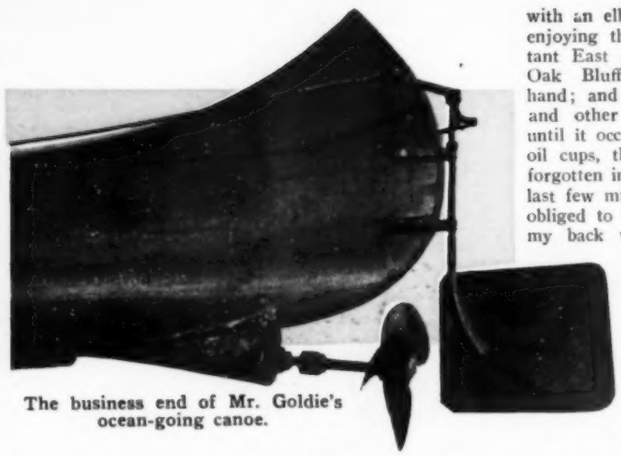
Our flight was rapid and it was not long before we were at the entrance of the gorged waters, the passage of which I had been warned not to attempt in my frail craft. As it was some years since I had shot the place the chart was brought out that there might be no mistake made. I did not say mistakes, for, in that place, there is little chance for two.

Having refreshed my memory the helm was swung to port and we were soon in the quickening influence of the crowding waters. Well off the starboard bow was the peaceful shelter of Hadley's Harbor, ahead were the rocks over which the water starts to rush, broad on the port beam lay the gravel banks and jutting rocks of the mainland.

Quickly we entered the swelling flood; the center seemed to be raised higher than the edges. Then came the swirls, eddies and whirlpools, one of the latter with a hollow core of several inches and a diameter of twenty-five or thirty feet appeared dead ahead. There was no time for thinking and with instinctive movement the helm was thrown to port as the bow entered the circling water, and to starboard as it was catapulted across the gaping vortex; no time for a breath of relief, as with our speed augmented now to twenty miles an hour I watched with rapid glances either side and ahead for any sudden uplift of the water; shoots of spray; curvings over into little pits with a backflow; water breaks, large or small; foam which was made on the spot, or drifting; color; each of which told its story: the sudden uplift, if low, that there was plenty of water for the canoe, considering the rapidity



The course, shown in green, was from New Bedford through Woods Hole to Hyannis and thence to Monomy Point.



The business end of Mr. Goldie's ocean-going canoe.

of the current; shoots of spray, that the rock was close to the surface; curving of the water into pits, that the water was flowing over an obstruction into water which was being backed up by other obstructions; water breaks, that there was a shoal of rocks; the making of foam, that the obstructions were close to the surface; drifting foam, that the water was good if fairly regular. Then there were the color indications, the different densities of white, gray, brown and black. The more vivid the color the nearer to the surface was the obstruction. The white indicating sand, or a clean rock; gray telling of gravel, or clean rocks; the brown, and black, of rocks covered with weed of different varieties.

It takes long practice combined with study to become familiar with these thinges, but just here lies the difference between a man who boats all his life, yet knows little but the handling of his boat at the end, and another. All of these little knowings broaden the field of the yachtsman so greatly that there seems no end to the variety and interest.

But where was the black can buoy, that great mass of steel and rivets placed to mark the corner of the patch of rocks around which the rushing flood turns into Broadway? Not seeing it and knowing its fate I hugged the dangers on the port hand, for they are visible, though bad to associate with closely. The black can was below; down so deep that not even an occasional gurgle, or momentary swelling of the water marked the spot; and there it stayed in gigantic struggles with the rushing, overwhelming tide for hours ere it was allowed a short respite from the engulfing embrace.

Seconds were the time granted for reasoning out its absence; and we swung into Broadway at terrific speed, discovering close ahead a patch of water perhaps forty feet long having a drop of nearly a foot, but being sure of the depth, I sent her through it.

Then we had a breathing spell, though still traveling in a five or six-knot tide. The U. S. Fish Commissioners' steamer ranged alongside and the delegation aboard gave the tiny canoe and her voyager a hearty huzza and waving of handkerchiefs. At the entrance to the passage, off Nobska Point, could be seen a strong tide rip. It lay directly in the path. To dodge it would cost a mile of travel; through it we would go and take whatever was in store. In a few moments the roar of the rip could be plainly heard, the irregular leaping and breaking of its waters looked like a doubtful proposition for the canoe. Swish! one of the seas struck her aft of the bow; its effort was futile; instead of crushing the elastic deck it slid into the water on the other side. Up! up! went the canoe as another struck her amidship and mounted the side canvas, which was then stretched across my shoulder, until the crest of it toppled over into my lap. Sliding, plunging and rearing; with bow once high in the air and again below the surface, as the seas passed under or flew over her, she tore along.

After a half-mile of this we slid into Nantucket Sound, and skimming the surface of water on which there was no ripple, I lay back with an elbow on either gunwale enjoying the scenery of the distant East and West Chops, and Oak Bluffs, on the starboard hand; and of Falmouth Heights and other places on the port, until it occurred to me to fill the oil cups, they having been quite forgotten in the excitement of the last few miles. To do this I was obliged to twist in the seat until my back was toward the bow. While thus engaged there came a sickening thud at the bow followed by a queer scraping sound along the length of her bottom, the boat coming to a standstill with the motor going at about half speed. Immediately there arose astern a solid mass of seaweed nearly ten feet across. That a considerable portion of it was entangled in the propeller was a certainty.

The situation was helpless indeed; not a sail in sight, the nearest shore miles away, and no amount of craning or neck-stretching enabling me to get even a near-glimpse of the propeller or rudder. There was one way to see what had occurred astern: to rip the after canvas deck with a knife and take the chance of tipping the canoe by working my way aft to within reaching distance of the trouble. That was a remedy of last resort, for, should a blow come up (and one did), the canoe would fill quickly and easily through the rent in the deck.

Let no enthusiast imagine that an unprotected canoe can live in an ocean blow; neither could an undecked ship. Finally I began to twist the wheel violently, turning the rudder quickly from side to side; the effect was immediate; the bow wave grew with such speed that by the end of ten minutes it was a foot high and the canoe traveling at a ten-mile clip.

So cheerful did I become that the harbors on the way no longer had any attraction for me, and I steered for Monomoy. But fate had ordained otherwise. A breeze had sprung up, the ripples became waves, and the waves seas. Long before arriving abreast Hyannis the canvas was laced securely fore and aft, and its edges caught up over my shoulders. Under full storm rig we bowled past Osterville taking the chance of making Hyannis, full eight miles away. It was grand going. The exhilaration of the sweeping seas in the bright sunshine was a specific for the brainfag in any man. The salt crust growing and thickening and hardening on all the exposed parts of the skin where it was being deposited by the ever-increasing spray, is one of the best stimulants known. The lungs were pumped full of the finest air on God's footstool. The brightness, the joyousness of the care-free romp over the swelling mounds of sparkling green as they chased each other on, ever on into the shoreward blend, took the strain from the nerves and gladdened the heart until one forgot but that it might last always.

But there comes a time, even as with the boisterous leaping of a dog in his greeting to his master, when the rush of the sea begins to wear on one. It was so when we had traveled several miles and as Hyannis was close aboard the bow of the canoe was headed for the entrance.

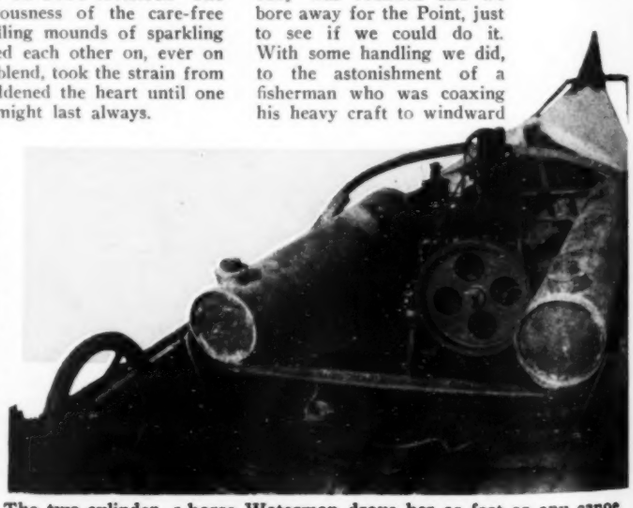
Never having been into the harbor the various shades of green that confronted me were not reassuring. When within a half mile of the outer shoal I could make out by the color that the bottom before me was all sand shoals. I then began selecting the darker shades of green and avoiding the lighter ones; a very dark green, in clear sea water with sand bottom, will have from eight to twelve or more feet over it; and so all the way through the different shades until one is looking at nearly a white, though it still retains the green tint; such a color will have but a foot or less of water over it. In this way I chose always the darker streaks on the water; though the streaks were steadily getting lighter, yet they were darker than the water on either side of them.

Having been many hours in the canoe and somewhat tired, the beauty of the place appealed to me as a nice one in which to spend the balance of the day and await the dying of the breeze.

At dawn the next morning I was down on the shore sizing up the wind. It had not lost a particle of its strength; the situation was not encouraging, for to the eastward—and that was to be my line of travel—the inlets were all protected by bars on the outside; and as the wind had been blowing shoreward with increasing velocity since the morning before, the bars would be covered with breakers.

After studying the indications for nearly two hours I determined that it was a growing storm and that as I was to stay there for at least a good part of the day it would be entertaining to visit the vicinity that was in comparative shelter. Hyannis port, lying under the shelter of a breakwater a little to the west of Hyannis, seemed good, so I headed out of the harbor intending to range along behind the shoals to the shelter of the breakwater.

The feelings which impel men at times are, to say the least, strange. Beyond the shoals was that which, if permitted, would confine me in a place I desired to leave. I would go out a short distance and try its strength. Accordingly the canoe was headed not toward the shelter of the breakwater but through the channel threading the shoals. As one bend after another was turned and we neared the open, the seas became heavier, the canoe putting her bow under occasionally. The last piece of channel leading to the outer buoy was entered. The seas became sharp and high. As the bow dove in they would rush over the canvas deck, whip against the peak and, driving into the air, come down on me in a drenching shower. This being repeated with almost every wave, seeing soon became difficult, so scoring was the effect of the salt on the eyes. The motor was slowed down and we edged along to the buoy. The mental argument then was to run at least to Point Gammon; it was not far away, and the run of the seas would be easier when they were on the quarter; so, against the judgment of the inner self, the buoy was rounded and we bore away for the Point, just to see if we could do it. With some handling we did, to the astonishment of a fisherman who was coaxing his heavy craft to windward



The two-cylinder, 5-horse Waterman drove her as fast as any canoe has a right to go.

under a double-reefed mainsail with difficulty.

Arriving abreast the Point it did not take long to decide that we should not be out there, so the helm was put to port that we might come about to windward. The maneuver was only half executed when it became as plainly evident that the canoe could not be brought up into the wind or she would get smashed to pieces in the seas which were running; neither would wearing ship be of any use, for we had run too far to leeward to have any chance of getting back to Hyannis.

A nice predicament; Harwich and the other inlets along the coast to leeward protected by bars, the attempt to cross which in the heavy weather prevailing would produce but one result. Monomoy, fifteen miles away, straight across the open sea, was the destination originally planned, and there appeared to be the best of reasons why the plan should be adhered to. But how to lay a course for there! The compass was in the box before me, spinning like a most infuriated windmill. Nor would putting the finger on it produce any effect, for the moment the finger was removed, the swash of the seas sent it on its merry rounds without a single oscillation.

The canvas spray cloths practically cover the entire boat and these or a deck are absolutely necessary on a canoe that is to be used in rough water.

Now, began some thinking. Already the land was disappearing in the mist of the "smoky sou'wester"; there was no turning back; no harbor to leeward could be entered; Monomoy Point was the only place left to run for, it afforded a sort of a lee, and when the tide served the canoe had an even chance of being able to float across the beach into Powder Hole for shelter. Point Gammon was yet to be seen on the port quarter; also the Bishop and Clerks lighthouse was in plain sight forward of the starboard beam; the sun cast through the thick air a slight glint on the water, and my watch said 6:05 a.m. Now, by pointing the hour hand at the center of the sun-glint on the water, which was better defined than the uncertain glim overhead, I knew that half way between the hour and twelve on the watch was south. As the hour hand was at six, half way from it to twelve was nine; therefore, nine representing south, and six representing east (as it must at six a.m.); east south-east, my course, lay one-quarter way between, or at 6:45; so I took careful observation and saw that 6:45 on the watch gave me a course well on the southern edge of the sun-glint. This was verified by the known position of Point Gammon and of the Bishop and Clerks. All of the foregoing were used to find the compass run of the waves. If the glint failed the waves would be steered by; should the wind shift there would remain the makeshift of trailing a long line astern.

The land and the lighthouse soon disappeared and I was alone on the racing, foaming sea. To say that I was lonesome only half tells it. To say there was discouragement would not be right, the margin of safety being so small there was neither room nor time for such a feeling. It required a hand lacking the paralysis of fear to guide the canoe among those leaping, wolfish white fangs as they shot over the craft and twisted it this way and that in the effort to get a hold of some kind. At times the broad wholesale smother as a sea got a better hold than its fellows caused a momentary doubt.

Again, the continuous roaring of the breaking waters and the inability to see anything beyond a small circle, and only one's self and a tiny boat within the circle, would get on the nerves and make one wish for a sight of a vessel of any description. At other times would come the thought, what if Monomoy Point were missed? It was but an eighth of a mile wide strip of low-lying sand and in the grayness could easily escape detection. Then, if by chance I passed to the east of it instead of to the west I would be in the same situation as when Hyannis was left to windward, excepting that in the latter case there would be fifty miles to run before a harbor could be made. Never had I been so utterly unable to grasp the outcome. Drenched from head to foot I sat there and watched the seas and steered; lost the glint and scrambled to pick it up again; was swept so much sidewise that the course would be lost; steered by the seas for considerable intervals as an extra thickness drove through the upper air; watched the motor for fear it might stop, for it was being run at the slowest speed possible, and at that the canoe was at times half buried.

Thus were we traveling when to my great joy a perpendicular line appeared in the sky at an elevation of about thirty degrees. That it was a wireless mast I knew in an instant. Those lines without connection, apparently, above or below, were no strangers to me; but this one, in this strange place, whence was it projected? Chatham could be its only location. In case the surmise was correct I had passed miles to the west of the Point, and must then be miles beyond it, as Chatham is eight miles beyond Monomoy Point. Wherever it was I did not care. It was connected with civilization and I would steer for it until the canoe grounded, for there would be no swell or breakers at Stage Harbor, the back-door of Chatham.

After what seemed a long time the line began to descend earthward, getting rapidly nearer to the visible horizon. Soon there appeared a bump beside it, then one on the other side, and I knew I was safely through.

The Regatta at Cambridge.

Preparations for One of the Big Events of the Season and a Number of the Prominent Boats that Have Already Been Entered.

By S. S. Scott.

THE Cambridge Yacht Club, of Cambridge, Md., is about the busiest organization in motorboatdom these days and the way in which the regatta committee is going after entries for their big water carnival, which will be held June 28 and 29, and the responses received, indicate that the Chesapeake Bay will undoubtedly become a prominent spot on the power-boat map this summer. The entries, so far booked, are: J. H. Ryan, Reliance V and a 20-footer; James Busic, a 26-footer and a 20-footer; Breeze & Breeze, a 20-footer; Alfred I. DuPont, a 20-footer; T. Coleman DuPont, a 26-footer; Peter V. Hoy, a 20-footer; White Brothers, Sand Burr II, a 20-footer; James Waddel, Imp, a 26-footer; Charles Faulkner, a 20-footer, and Charles Mace, Winton Six, a 20-footer.

The regatta committee is in communication with more than a score of owners of 20-footers and 26-footers and while many of them have written that they may enter, all declare that it is rather early in the season and that they have not yet had an opportunity to give their craft a tryout to see what speed can be made.

The club will offer for the 26-foot class, the 20-foot class and the free-for-all class three trophies, each to be known as the Commodore Alfred I. DuPont Atlantic Coast Championship. These trophies, which are now being made will be well worthy of being won, and it is hoped by the club that they will, in future years, represent to the motor boating fraternity the highest honors to be captured by speed boat enthusiasts.

As an inducement the Cambridge club offers one of the finest racing courses to be found in this country. The Choptank River, just off the town, is three to four miles wide and, where the official 10-mile course will be laid off, is 20 feet deep. One of the features of the river is that the water is always smooth and is free from flotsam, so that the danger of one having a boat damaged is reduced to a minimum.

The course will be surveyed by the Geodetic Survey and, during the carnival, will be patroled by the revenue cutter service.

One of the features in connection with the regatta will be a race for cruising motor craft from Baltimore to Cambridge, in which craft from the Baltimore Yacht Club, the Baltimore Motor Yacht Club and the Corinthian Yacht Club will enter. In addition the Maryland Naval Brigade will attend the regatta and will give an exhibition whale-boat race.

DEAD RECKONING.

Keeping Track of the Boat's Position Without the Use of the Sextant. The Second of a Series of Articles on the Various Phases of Navigation.

By William C. Ward.

Every true motor boatman is interested in the problems of the real navigator whether he expects actually to do much extended cruising or not, and Mr. Ward in his articles on the subject is giving us this information in as simple a manner as it is possible to treat it. In this article are discussed the various problems of distance and direction upon which the whole science and practice of navigation depend. The knot and its relation to latitude and longitude, as well as the magnetic system of direction, are described with rules and reasons for correcting compass courses. In a very simple way the various "sailings" are treated, showing how a vessel is taken from one port to another without the use of astronomical observations.—Editor.

THAT same vagary of nature which conceived what are factorwise so utterly irreconcilable as the several celestial time schedules planted two more such stumbling blocks in the path of navigation. Astronomers have devised the leap year and a few further makeshift corrections which they apply every once in a while to make us believe we can keep some kind of solar time with a clock. But this little fiction is child's play alongside the contortions they went through before they evolved a mean solar day that could really be divided into 24 hours of somewhat equal length, and, no matter how beneficial the result may be to "sky-piloting," the navigator is still without a unit of terrestrial distance that bears any definite relation to the angular elements of the earth; neither has he any readily get-at-able North as a starting point to which he can refer the all-important matter of direction.

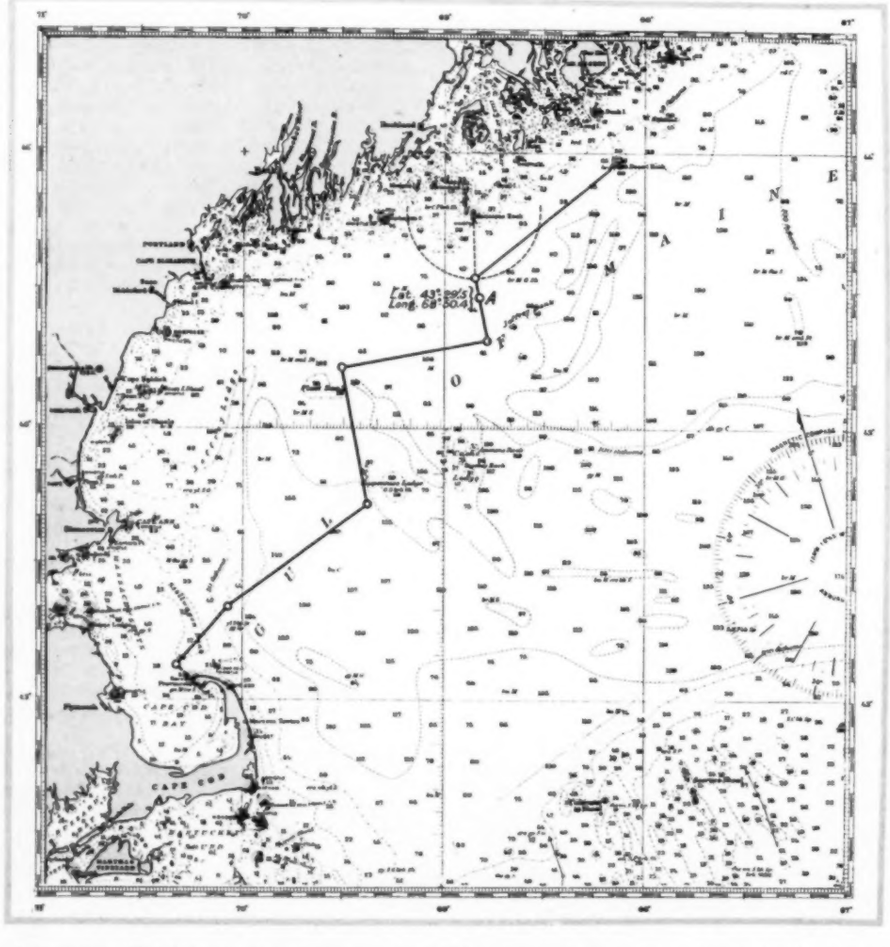
Were the earth a sphere it would be easy to fix upon some kind of mile that would mean something in terms of latitude and longitude, as well as distance, just as the lengths of parts of a compass-card circumference that contain the same number of scale divisions always measure equal angles at the center. But the earth is no sphere, and one has one's choice of an assortment of miles, ranging all the way from arbitrary units to well-meaning, though meaningless, standards based on different terrestrial measurements in an effort to fix upon a mean nautical mile that is of no particular value, now that they have it. A statute mile is defined by British law as "eight furlongs of 60 perches of 16½ feet each," or 5,280 feet. A geographical mile is the length of one minute of arc along the equator, which is 24,902.18 statute miles, or 131,843,510 feet divided by 360 × 60 and works out 6,087.2 feet. But a nautical mile is neither of these; it depends upon the earth's shape as well as its size.

The earth's equatorial diameter may be taken as 7,926.59 statute miles, and the polar axis as 7,899.58. The compression is, therefore, $\frac{1}{293.5}$ 27.01 miles, or —— of the equatorial diameter. But it is the flattened great circle passing through the poles that causes the trouble, the varying radius of curvature as the meridians leave the equator causing equal angles at the center to intercept unequal arcs along the circumference so that the length of a minute of latitude, which has always been looked upon as the ideal mile, is different in different latitudes.

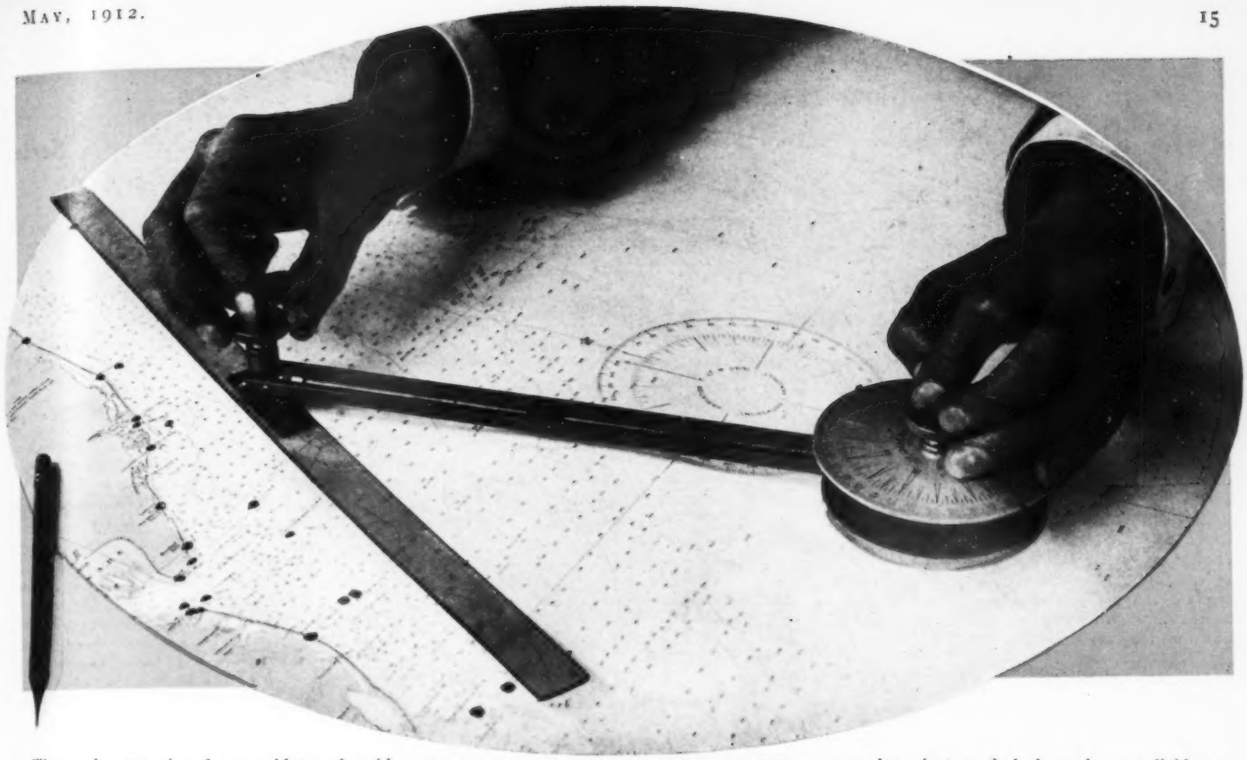
The mean of the polar and equatorial diameters multiplied by 3.1416 gives the circumference of this average great circle whose length is 24,859.7 miles or 131,259,156 feet. Dividing this by 360 × 60 the mean sea mile, so-called nautical mile or "knot," comes out as 6,076.8 feet. Its universally accepted value today is 6,080 feet, which is its real value in latitude 48, and about the most convenient length for the British navigators, who have passed it on to the rest of the world along with their Greenwich prime meridian and a few other maritime staples.

At the equator this nautical mile is 6,046 feet, and at the poles 6,109 feet. The 63 feet per mile difference is by no means appalling, since ships are not navigated by yards, feet and inches; but the real reason for the unpopularity of the sea mile is fundamental and not hair-splitting, as will appear as soon as one begins to convert distances east and west into degrees and minutes of longitude. It is well to remember that 13 nautical miles equal 15 statute miles, and as the secant of 30 degrees happens to resemble this ratio very closely, knots and miles can be interconverted at a glance by consulting the 30-degree page of the traverse tables, where, considering the figures in the latitude column as knots, the adjacent figures in the departure column will represent the corresponding number of miles.

But a knot that would have everywhere as nearly a definite relation to a minute of longitude as it has to a minute of latitude would only half-way simplify things. Direction has still to be reckoned with; and, while everybody has become accustomed to consider the bearing of Polaris as astronomical north, Polaris is nevertheless no more a real pole star than any other one; for it bears north only when it is on the meridian either above or below the pole of the heavens, and this is just as true of the Southern Cross, the sun and the moon. Polaris has one advantage, however, in that it stays within two degrees of the pole all the time, but the pole of the earth is continually spoiling this and inclining toward the constellation Lyra at a rate that will depose Polaris and install Vega as the pole star some 12,000 years hence. While this remote event is not disturbing people at present, there is a real wabbling of the earth's axis going on all the time that does bring quick results, and it is a part of the universal gravitation system that keeps the whole universe going.



A traverse sailed between two places may be laid down on a chart or, if no chart is handy, it may be computed from the traverse tables.



With some of the patent devices for laying courses, true bearings may be laid down at once without the bother of correcting them for compass variation.

The sun's attraction for an oblate spheroid, ellipsoid, or whatever is the shape of the earth, is not at all what it would be for a sphere. When the sun is at either equinox, that is, vertically over the earth's equator for the time being, the attraction is the same as if the earth were a sphere; but when the sun is at or near either tropic its attraction for the terrestrial bulges along the equator has a tendency to pull that matter toward the plane of the ecliptic, or apparent path of the sun through the heavens, and to make the earth's axis perpendicular to it. If this influence were to have its way the equator and ecliptic would coincide, which, incidentally, would make an end of our seasons. But the gyroscopic effect of the rotation of the earth on its own axis prevents this, and the result is merely a wabbling motion exactly like that of a spinning top, which inclines a little and straightens up again several times before its rotating momentum is so far spent that it falls. The upper point on the circumference of this top describes circles of varying sizes exactly as does the north pole of the earth in its wanderings about the pole of the heavens.

The precession due to this attraction amounts to 50.41" a year, but gravitation among the planets causes a small motion in the other direction so that the total effect amounts to about 50". Dividing 360 degrees by this small angle, the period of one complete cycle of wabbling works out something like 25,868 years.

The moon, too, causes a similar irregularity, though smaller in amount, and its period is about 19 years. Under this influence our axis dips a little toward the equator and then recovers as the earth and moon change their relative positions.

The gist of all this is that the earth's axis describes a lop-sided cone out in space, pointing to various "north stars" at intervals of 26,000 years, so that a true north for the astronomical purposes of navigation must of necessity be handled with care. But this is no circumstance to our troubles with the true north point of the earth, notwithstanding that we have the earth right under our feet where we can measure it, instead of away out in space like the celestial pole. Of course, there is the gyroscopic compass that will point true north as long as its disc is kept rotating, once the astronomers have taken it to an observatory and aimed it correctly; but until this type comes into general use navigators will have to content themselves with the time-honored magnetic compass and all its vagaries.

In the first place, the north to which the magnet points is the true geographical north at only very few places on the surface of the earth. The globe, as a spherical magnet, has magnetic poles at the extremities of one of its diameters, and if this axis of terrestrial magnetism coincided with the axis of rotation the question of direction would become a very simple affair. But like everything else in nature the magnetic axis is a little off the center, the magnetic and geographical poles being far from coincident. At points along the circumference of one great circle of the earth the magnetic and geographical poles happen to be in line with each other, and, barring outside influences, the compass points true north. This circle, or rather near-circle, for it is as irregular as everything else connected with it, is called the agonic line or locus of no deflection. At points to the eastward of it the compass north is deflected toward the west of north, and at points to the westward the needle is likewise deflected to eastward. In other words, there is westerly variation in what is magnetically the eastern hemisphere, and easterly variation in the corresponding western hemisphere.

Along the eastern coast of the United States the compass north is drawn to the westward of the direction of the geographical meridian in amounts varying with different places, and the amount of the variation is changing all the time as the movement of the magnetic poles themselves progresses. On all the coast charts both true and magnetic compasses are given, usually superimposed so that either magnetic or true bearings may be read from one position of the parallel rulers when laying down a course or bearing, and these two compasses placed in this manner afford an excellent opportunity for fixing in the mind the relation between true and magnetic directions which is one of the most important points in practical navigation as well as unqualifiedly the chief source of those errors which lead to disaster. To apply the correction to a compass course incorrectly exactly doubles the error which it was sought to eliminate and, as is always the case where one has the choice of just two things, it is the easiest thing in the world to do wrong. Mistakes of this kind are by no means confined to the tyro. Experienced navigators find themselves so liable to error that they always uncorrect their corrected courses to see if they get what they started with. Therefore, the matter deserves attention right here before we start sailing traverse of compass courses.

On the accompanying chart the variation is marked 16° 45′ westerly, and it is seen that the compass north is that amount to the westward of the meridian of longitude passing through the center of the compass. That is, the compass north is really N. 16° 45′ W., and in like manner east by compass is E. 16° 45′ N., true; south by compass, S. 16° 45′ E., and west by compass, W. 16° 45′ S. Or, to epitomize things, the true course is to the left of the magnetic course when the variation is westerly, and, as might be expected, to the right when the variation is easterly. As a further example S. 45° W. magnetic would be S. 28° 15′ W., true. In applying the correction to right or left the observer imagines himself at the center of the compass and facing the course to be corrected.

So much for the vagaries of terrestrial magnetism. But the vessel herself always contains enough iron and steel to start up some compass errors on its own account and they are more troublesome than those caused by the earth, for they are different for every vessel, and worse still, different in the same vessel on every course steered. They are corrected as nearly as possible by placing counteracting magnets in the vicinity of the compass, as will be described in another article; but since they can rarely if ever be completely wiped out, it is just as well to take them as they come for the present. Deflections of the compass needles, due to the iron of the ship, are called deviations to distinguish them from the discrepancies between true and magnetic direction with which they have no connection whatever, but whose nature they exactly resemble. Uncorrected westerly deviation always causes a ship to fetch up to the left of her destination, and uncorrected easterly deviation to the right.

Some idea of the deviations on the cardinal points can be roughly obtained by heading the vessel directly toward the sun at noon when it bears about south. If the compass should then read S. 5° W., the true course is to the left of the compass course, and the total compass error is 5° westerly. Now the variation on the chart is 16° W.; so that the compass deviation, which has counteracted part of this must be 11° easterly. Then bringing the sun abeam, the deviation on west can be obtained

Compass Course.	Patent Log.	Distance.	Variation.	Deviation.	Total Error.	True Course.	N.	S.	E.	W.	Remarks.
N. 36 W.	7.2	5.0	16 45 W.	5 E.	11 45 W.	N. 47 45 W.	3.3	——	....	3.7	Race Point Lt., S. 47 45 E., distant 5 miles.
N. 54 E.	24.7	17.5	16 45 W.	5 E.	11 45 W.	N. 42 15 E.	13.0	——	11.7	....	Wind baffling. Lying on tack nearest course.
N. 65 E.	62.7	38.0	16 45 W.	5 E.	11 45 W.	N. 53 15 E.	22.9	——	30.3	....	Wind baffling. Lying on tack nearest course.
N. 2 E.	93.2	30.5	16 45 W.	2 W.	18 45 W.	N. 10 45 W.	29.9	——	....	5.8	Wind baffling. Lying on tack nearest course.
N. 73 E.	25.3	32.1	16 45 W.	10 E.	6 45 W.	E. 10 45 N.	6.1	——	31.4	....	Wind baffling. Lying on tack nearest course.
N. 8 E.	35.3	10.0	16 45 W.	2 W.	18 45 W.	N. 10 45 W.	9.8	——	....	1.9	Took in sail and proceeded under power.
							85.0	——	73.4	11.4	
									11.4		
									62.0		

In the traverse tables the difference of latitude 85 and departure 62 are found together on the 36-degree page, and opposite to them in the distance column is the number 115. The course made good is therefore N. 36° E., true, and the distance traveled in that direction is 115 miles.

from the difference between west and whatever the compass may read. In like manner the deviations on south and east can be approximated. To do the thing right, however, it is best to get from the chart the magnetic bearing of a line connecting two prominent objects ashore, take the vessel out in the stream and bring the objects in range; then steam across this range on different courses, taking its bearing by compass for each point or two points of the compass. In this way it is easy to construct a table of deviations from which any proposed magnetic course can be readily converted into a course to be steered by compass, and, conversely, a course actually steered can be converted into a magnetic course that will mean something when laid down on the chart. All these precautions may seem over-elaborate for small craft; nevertheless it is no uncommon thing for the iron fastenings and things in a common pulling boat to cause her compass to read east when she is really heading nearly south. The practical uses of these considerations of distances and compass errors will become apparent in the solutions of sailing problems.

When a vessel runs several courses and distances her position at the end of the run is the equivalent of some one resultant course and distance that would produce the same result, and the so-called "day's work" or traverse consists of the solution of this problem. A vessel bound from Provincetown, Massachusetts, to Mount Desert Island, proceeding under canvas part of the way will furnish a good example of traverse sailing, in which each course sailed is considered as the hypothenuse of a right triangle on a plane surface, having the difference in latitude for its altitude and the departure east or west from the meridian for its base.

A page from the log book kept on this cruise shows very nicely the correction of compass errors and the reduction of compass courses to true courses, as well as the arrangement of all the little eastings, westings, northings and southings gotten from the traverse table and tabulated in the ship's log ready for working up results. The traverse table is merely a table of right triangles computed for every degree of compass courses, and giving the difference of latitude and the departure for every mile steered on that particular course. This table is found in all the epitomies of navigation, and in Bowditch's American Practical Navigator, which is published by the Navy Department and sold for $2.50, there is a table giving the courses in degrees as well as in points of the compass. This is particularly desirable on account of the ease with which compass courses reckoned in degrees from zero at north around to 360, calling east 90, west 270, etc., can be corrected for deviation and variation. To such a course an easterly correction is always additive, and a westerly one always subtractive without burdening the mind with any further rules. So long as one sticks to the shell-back's N. N. E. ½ E. type, of course one will be salty; there's no denying that, but all the same one can escape a lot of annoying rules and mistakes by adopting the common-sense way of dealing with courses and bearings at the start.

This course and distance laid off from the point of departure places the ship at A on the chart, and, as darkness comes on, it is desired to confirm the position by observation before undertaking a night run. From the light list it is known that Matinicus Light can be seen fifteen miles, and if the reckoning is correct the vessel is due to enter the zone of visibility a few miles farther on along the present course. Then when the light is "raised" it will be known that the ship is somewhere on the circumference of a circle whose radius is fifteen miles and whose center is at the light. A bearing of the light taken at the moment it is sighted will cut this circle at the position of the observer, and when plotted on the chart serves as a new departure for laying the course N. 68° E. for Mount Desert Rock.

In the preceding traverse only short distances were used, and no account was taken of the curvature of the earth. Had it been desired to locate the point A by latitude and longitude, instead of by bearing and distance, the case would have been different. The new latitude would evidently have been that of Cape Race Light plus the sum of the various northings in the traverse table; that is, 42°-04′.5 plus 85 minutes, equals 43°-29′.5. But to find the number of degrees and minutes corresponding to the departure 62 miles in latitude 43 requires some computation.

In the figure T and T' are to places in latitude MCT, MM' being their difference of longitude or arc of the equator included between their meridians of longitude. TT' is the departure, easting or westing, as the case may be. OT or r is the radius of the parallel TT'; R equals 1, being the radius of the earth. TT' and MM', being similar parts of circles, are to each other as their radii, or

$$TT' : MM' :: OT : CM,$$

which is the same as $\frac{\text{dep.}}{\text{diff. long.}} = \frac{r}{R}$

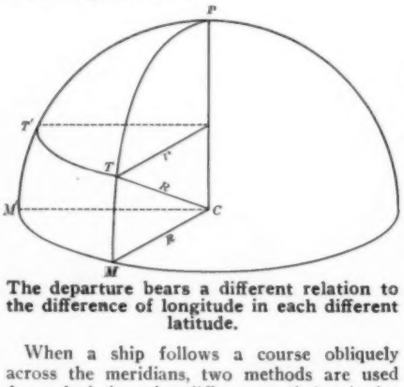
But $\frac{OT}{R}$ = cosine latitude, or cosine latitude = r.

Now substituting in the original proportion, departure : difference of longitude :: cosine latitude : radius of earth, or departure = difference of longitude × cosine latitude, and difference of longitude = secant latitude × departure.

Using this formula, the difference of longitude is obtained very easily from the logarithmic tables contained in every manual of navigation:

log secant 43°—29′ .4	0.13587
log 62.0	1.79239
log diff. long.	1.92846

diff. long., 84′ .12, which, subtracted from, or applied to the eastward of, the longitude of Cape Race Light, 70° 14′.5, gives 68°-50′.4 W. as the longitude of A.



The departure bears a different relation to the difference of longitude in each different latitude.

When a ship follows a course obliquely across the meridians, two methods are used for calculating the difference of longitude: Middle latitude sailing and Mercator's sailing. The latter would always be perfectly correct if the tables of meridianal parts, or augmented differences in the lengths of degrees of latitude, were carried out to a sufficient number of decimal places. The former is but an approximation, another of those averaging schemes, although sufficiently accurate for short runs, such as a "day's work." In calculating long distances, however, considerable error is apt to creep in. The latitude along which the departure is converted into difference of longitude is the latitude half-way between the point of departure and the destination. For places situated on the same side of the equator it is the regular arithmetical mean or half-sum. The method should not be used for places on opposite sides of the equator.

The formulæ used in middle latitude sailing are all derived from a conventional figure made up of the simple plane right triangle from which the preceding traverse was worked, and the conventional triangle of parallel sailing, from which we have just worked out the problem of finding the difference of longitude corresponding to a given departure in a given latitude. In the small triangle AEB the hypothenuse is named difference of longitude simply so that its length will vary as the secant of the middle latitude, and thus vindicate, as it were, the formula derived above. Then the base of the small triangle is attached to that of the triangle of traverse sailing, which, as before, deals only with course, distance, difference of latitude and departure. With this conventional figure and the plane right triangle formulæ fixed in the mind, all the problems in the sailings can be readily solved.

For example, it is required to find the course and distance between Cape Cod and Saint Mary's, Azores:

	Latitude.		Longitude.	
Cape Cod	42—03 N.		70—04 W.	
St. Mary's	36—59 N.		25—10 W.	
Diff.	5—04	(304 miles)	44—54	(2,694′)
2)	78—62			
Mid. Lat.	39—31 N.			

From the triangles:

dep. = diff. long. × cosine Mid. Lat.

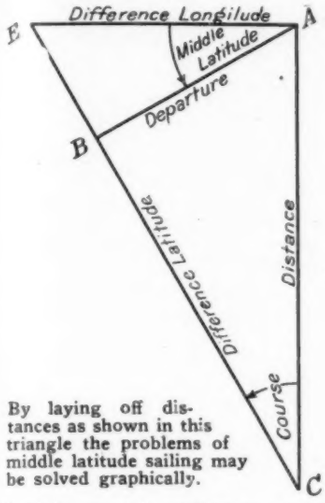
tangent Co. = cosine Mid. Lat. × diff. long. ÷ diff. lat.

distance = diff. lat. × secant course.

Diff. lat.	304			colog	7.517	log	2.482
Diff. long.	2,694	log	3.430	log	3.430		
Mid. lat.	39—31′	1 cos	9.887	1 cos	9.887		
Dep.	2,078	log	3.317				
Course	S. 81—41′ E.			1 tan	0.834	1 sec	0.839
Distance	2,101					log	3.322

Ingenious juggling of formulæ will force the ordinary traverse table of plane right triangles to give up all this information, but the operation is more tedious in practice than the handling of logarithms and the working out of the formulæ as they are derived from the conventional triangle. For example, here is the way this particular problem would be solved by the traverse tables: Look for the middle latitude as if it were a course in plane sailing, and the difference in longitude in minutes in the distance column; opposite, in the latitude column, will stand the departure. Having gotten the difference in latitude and departure, the course and distance can be found by casting about the table until the known difference of latitude and departure are found in their respective columns. The corresponding tabular course will then be the angle at the head of the page upon which this conjunction, or near-conjunction, occurs, and the required distance will stand in the same line in the distance column.

While it is quite possible to solve any of the problems in the sailings in this manner without the use of a single logarithm, it is also true that one could almost compute a table of logarithms while looking for the various landfall combinations upon which the inspection method depends. And altogether it is hardly



By laying off distances as shown in this triangle the problems of middle latitude sailing may be solved graphically.

worth while, except in working up a traverse, to bother with the traverse tables at all.

A modification of the middle latitude triangle, brought about by adding to *BC* the old difference in latitude, an increment *EB* to take into consideration the increase in the lengths of the elements of latitude as we approach the poles, gives the Mercator conventional triangle, with which courses, distances and departures can be found with an accuracy that depends merely upon the number of decimal places to which we carry out results. Take any two points, *C* and *F*, on a Mercator chart, and join them with a straight line, completing the right triangle *CEF* by producing the meridian through one point and the parallel of latitude through the other. The intercepted part of the meridian *CE* is this augmented difference of latitude; and of the parallel *EF* it is the difference of longitude. Hence, the angle *C* is the course. Moreover, the rhumb-line, or ship's track, is represented by the straight line *CF*.

In solving problems by Mercator's sailing, the departure is gotten by using the difference in latitude direct from the smaller triangle; but in solving for difference of longitude it is necessary to take the augmented latitudes from the table of Mercator's projection (Bowditch, Table III), which is given in every handbook of navigation. Using these meridional parts and the formulæ for right triangles, the problem just worked by middle latitude sailing is solved more easily and more accurately by Mercator's method, as follows:

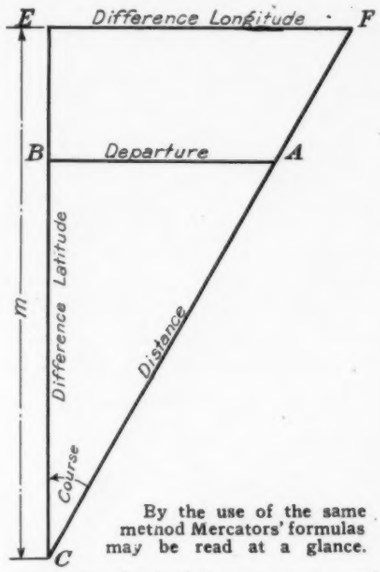
	Latitude.	Meridianal Parts.	Longitude.
Cape Cod	42—03 N.	2,770.4	70—04
St. Mary's	36—59 N.	2,377.6	25—10
Diff. Lat.	304′	m 392.8	diff. lcng. 2,694′

From the triangles: tangent $C = EF \div CE$

distance $= BC \times$ secant C

Diff. lat.	304		log 2.48287
m	392.8	colog 7.40583	
Diff. long.	2,694	log 3.43040	
Course	S. 81—42 E.	1 tan 0.83623	1 sec 0.84056
Distance	2,106 miles		log 3.32343

Finally, there arises the question: how nearly correct is this "dead reckoning"? And the answer is, that while a very careful navigator hopes to locate himself within five miles or so at the end of a day's run of 200 miles, he is never surprised to find his reckoning 20 miles out of the way. In fact, he becomes exceedingly cautious if the weather causes him to miss one of his routine shots at the sun, moon, stars, or anything that will give him a real "observed position" that he can bank on as correct within the probable limits of instrumental errors and the errors of observation, which do not ordinarily place him more than a mile or so from where he really is. Ocean currents set the vessel about, and sometimes very capriciously, as they may be quite uncharted and due to wind that is or has been blowing, not necessarily in the immediate neighborhood, but often many miles away. Of course, such well-known currents as the Gulf Stream are always allowed for by entering their set and drift as separate courses in the



By the use of the same metnod Mercators' formulas may be read at a glance.

traverse; but the Gulf Stream, too, is capricious and utterly untrustworthy. It is frequently caught running strong many miles from its charted course, and again is looked for in vain along its very axis. But "dead reckoning" has its uses, and not the least of these is the opportunity it affords to keep some kind of an approximate tab on the ship's position that is quite independent of clouds and weather. Then, too, latitude by "dead reckoning" is always good enough to use in computing the longitude from an astronomical observation, and conversely, the longitude by "dead reckoning" comes in handy for finding the latitude by observation.

How to Design a Motor Boat.

Perfecting the Design—The Last of Four Articles Presenting the Fundamentals of Motor Boat Designing in the Simplest Non-Technical Terms.

By L. B. Chapman.

We know of nothing that has been published on the subject that will give the non-technical reader a better understanding of motor boat designing and the knowledge of what constitutes a good or bad design than the four articles, of which this is the last. Mr. Chapman, a naval architect himself, has succeeded admirably in his attempt to present this subject in its simplest terms and we heartily recommend the series to everyone who is interested in motor boats, whether he actually intends designing his own boat or not.—Editor.

WE now come to the last of the articles dealing with motor boat design. We have already seen how to go to work to start a design, how to draw the lines, and how to make the necessary simple calculations. This leaves this last article to review the whole subject in a critical way and to take up some of the more interesting and more advanced considerations, now that we have the main ideas well in mind. As there are a great many points to be touched upon before closing, I can cover them only briefly and must refer the reader to more advanced works on naval architecture for a more complete consideration. The various points to be considered will be treated under their various sub-headings.

DESIGNING TO A DISPLACEMENT.

Quite often, for one reason or another, one desires to give a boat a certain displacement, and for the sake of those who may wish to design a boat of a given displacement, the following method will be found very simple. For instance, before starting out on the design of a cruiser, the designer may have sufficient information at hand to know pretty closely what his weights are going to be, or in a racer one may know his weights exactly. In both these cases the boat should be designed so as to have the correct displacement at the designed water line.

To do this, we start out as outlined in Part I and pick our dimensions as closely as possible and start the design as in Part II, drawing in a few preliminary sections, as figure 11. Now find the area of these few free hand sections and plot a curve of areas to a convenient scale and find its area as shown in Part III. This curve of areas may not be exactly fair at this stage of the design but some fair curve can be drawn approximately through the points and the displacement found. I believe that drawing this preliminary curve is a most excellent plan for it gives the designer some idea of the distribution of displacement and helps fair the design, for if the plotted points fall off of a fair curve, it shows the areas are too large or too small, as the case may be.

This first try at the displacement may give a result too large or too small and the sections will have to be changed. The draft, beam or length may have to be changed, or perhaps a change in the shape of the sections may bring about the desired result. A second trial should now be made and perhaps a third may be necessary to obtain the desired displacement.

In making these changes to get the correct area of the displacement curve, the designer should make them so as to get the best shape he can to his curve and the best distribution of displacement (see following discussion). In any design if one understands the curve of areas pretty well he can turn out an excellent design by drawing the curve of areas first and designing the boat so that the various sections have the area, as shown by the curve. However, I would not recomment either of the above methods for the first attempt at designing.

THE CURVE OF AREAS.

In the last article I mentioned this curve, showing how it was constructed and pointing out briefly its value. As I noted before, it represents the distribution of the displacement in a plane of two dimensions. Most men upon looking at a boat or model form some opinion as to the distribution of the displacement, the general shape of underbody, etc. That is, they notice whether a boat is too full forward or aft, too chunky and the like. It is pretty difficult to draw any definite conclusions from the lines so the curve of areas is drawn as in figure 19. An experienced designer can tell as much, and sometimes even more, from the curve of areas than the practical boatman can tell from the hull itself.

For the sake of an illustration let us imagine this curve to be of a piece of cardboard and a stream of water of the same depth as the cardboard flowing past it. The resistance to the water and the ease with which it is diverted from its natural path will depend upon the shape of the curve. With water flowing past at high speed one can see instantly the influence and importance of the shape of this curve. This is exactly what takes place with the boat itself; the curve and layer of water being extended from two to three dimensions.

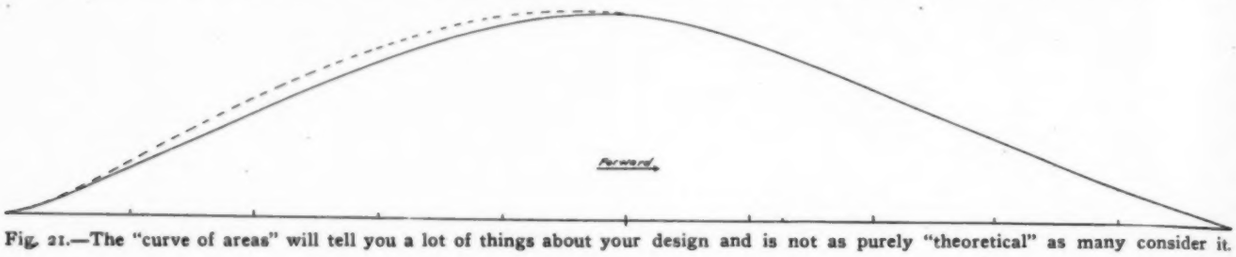


Fig. 21.—The "curve of areas" will tell you a lot of things about your design and is not as purely "theoretical" as many consider it.

Some ideas as to the shape of this curve can be found by plain common sense, other must be left to experiment. Fortunately, however, many model experiments have been made along this line and I will point out briefly some of the more interesting results:

First, let us turn our attention to figure 19 and study this curve a moment. Noting station 5 as the center, we see that it seems rather full and chunky looking, just aft of amidships: in fact, the lines aft (sections and water lines, figures 1 and 3) appear rather full on a little chosen observation—rather "tubby" looking, in fact. Figure 21 shows this curve changed to a sweeter and better looking curve (the old curve is shown slotted). This was obtained by redesigning the stern. This fullness of the boat aft was noticed in another way. The C.B. by calculations came rather far aft and we found difficulty in the calculation (Part III), in getting the (C.G.) center of gravity far enough aft. Even the second trial didn't bring C.G. far enough aft. The design given in Part I might have appeared very well to the beginner and would have been passed by many as "first-rate," as far as the underbody goes. However (figure 19), the curve of areas shows it up quickly as a rather poor design with too much displacement just aft of amidships. If the beginner will draw his curve of areas he may find many startling facts about his design not known before, and I think that it will also convince him the curve of areas is not so "theoretical" as some would try to make out. When I mention this curve, its shape, appearance, etc., it should be distinctly remembered that I am discussing the actual hull and only draw out the curve of areas to give a clearer conception.

As a help to the beginner I will mention briefly some of the results obtained by model experiments upon the curve of areas. Notice figure 22. Two curves are shown here both of the same length and area, which gives, of course, two boats of the same length and displacement. Curve "B" represents a boat rather fine forward and aft; while "A" represents a boat with the same amount of displacement but spread out more fore and aft. For low speeds curve "B" is the better, but for high speeds, such as displacement racing boats and fast yachts, curve "A" is the better; that is, as the speed goes up the displacement should be spread out more fore and aft. This is accompanied by cutting down the beam or draft and increasing the areas of the sections fore and aft of amidships. It should be distinctly remembered these two boats have the same displacement; that is, there is in both cases exactly the same amount of weight or volume to drive through the water. At first the reader might think a boat with fine ends the faster, but this, as just seen, is not so, for it gives a boat as represented by curve "B" with all the displacement concentrated amidships.

Experiments also show that for high speeds the forward end of the curve of areas should be rather full and for low speeds somewhat finer. I mean by this the very end of the curve and not the forward half. Curve "B" (figure 22) might have full ends, yet still have the bulk of the area amidships. Full ends mean filling out the area of the extreme end stations. For instance, notice figure 23 "B" represents the forward portion of the curve of areas (figure 19) for the design given. If this represented the curve of areas of a high-speed boat it would be rather poor; curve "A" (figure 23) would be much better, as it is a little fuller at the extreme end. The shape of the curve aft seems to have little influence with the exception of figure 24. Here a hollow curve is shown aft which means that the portion shown by the cross-hatching will be filled with dead water. That is, the boat will "drag" water and eddies will form aft, cutting down the speed considerably. One should be very careful not to have a too hollow curve aft or he will have a hard boat to drive and also a difficult one to steer. Any boat with a sharp or compromise stern needs displacement aft to keep it from squatting when under way. If the reader will keep these few points in mind and remember that displacement and curve of areas are one and the same, he will produce a much better boat than his fellow yachtsmen who know nothing of this subject.

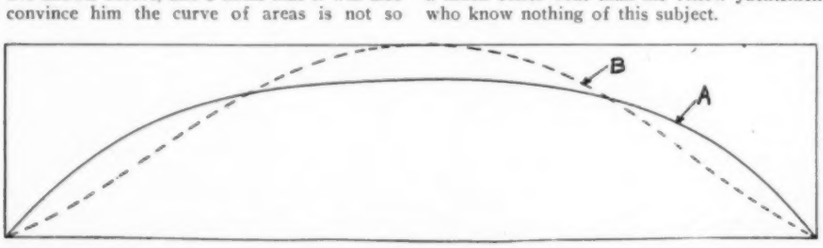


Fig. 22.—Of the two curves A and B, which are of the same length and area, A is better for speed than B; it shows a more even distribution of the displacement.

WATER LINES.

Water lines vary so widely in different craft that very little can be said about their shape, except in a general way. For high-speed work a fine water line forward and aft is the best. Combining this with a full curve of areas forward gives a boat with a fine water line and a rather full fore-foot below the water as the easiest to drive at high speeds. A "hollow" curve should never be used either forward or aft—as I said in Part II—let a straight line be the finest ever used. For low and moderate speeds a rather full water line forward and aft is much better than a fine one. Care should be taken when fine-ended water lines are used in high-speed boats not to let the displacement become too small at the ends, for in such a case curve "B" (figure 22) would be the result.

In drawing all the various water lines, diagonals and buttocks, just bear in mind that the water must flow around the boat as it is propelled through the water; *actually the water flows down under the boat following very closely the buttocks, so extra care should be given to these.*

THE MIDSHIP SECTION.

As far as speed is concerned the shape of the midship section has been shown to have practically no influence; the only considerations entering in are seagoing qualities and stability. A section as figure 25 is very bad in a seaway, as it is altogether too flat, and it should be avoided. On the other hand, a section with too much deadrise is not desirable, although the V-section predominating to-day in small runabouts has much in its favor. The midship section of the illustrative design (figure 26) is very good for a cruising boat. Racing boats are very often quite flat amidships, but it would not be in keeping with these articles to go into a discussion of racing boats.

FREEBOARD.

Freeboard one must determine for himself from appearance and current practice. The design given has altogether too much freeboard—in fact, it is a horrible example. The designer should have noticed this excessive freeboard in the small profile (figure 13) and cut it down to a more conservative amount. It is part of the designer's skill to get the right amount of freeboard and sheer, and many a good boat has been spoiled by too little attention to these points. I might mention in passing that any speed boat or cruiser likely to meet seas should be given a good freeboard and plenty of flare forward.

THE UNDERBODY.

I have discussed the general shape of the underbody pretty thoroughly under the head of curves of areas, but a few points remain to be mentioned here: First of all, the power used in driving a boat at a certain speed depends almost directly on the surface of the underbody and if the designer, by careful and thoughtful designing, can reduce this wetted surface to a minimum, there is so much more gained. Another point, remember that eddies form around blunt stems, sterns, skegs, rudders, etc.; fair these away as much as possible and there will be a gain in speed. It should also be remembered that the particles of water take paths around the hull (called stream lines) and any obstruction in these stream lines plays mischief with the speed.

POWER AND SPEED.

One of the first questions that confront the designer of any boat is the question of power and speed. How much power do I need? What is the best speed to drive her? What diameter propeller is needed? These are a few of the questions that come up at the outset. These questions should be pretty well settled and thought out in the preliminary work before beginning the design.

The speed and power of motor boats are very uncertain things because of the lack of reliable data and on account of the uncertainty of the power of gas engines. Some makers rate their engines too high, others too low, and the only reliable way is to make a brake test. Mr. Henry W. Kieth in MoToR BoatinG for June, 1911, gives a method of finding the power and speeds of motor boats. This article also shows a way of finding the correct propeller for the power and speed chosen. As

this excellent article ocvers this subject very completely I can do no better than to refer the reader to it, to work up the power, speed and propeller problems that confront him in a new design.

In selecting an engine for a boat the designer should take care to select an engine with the proper revolutions for the speed de-

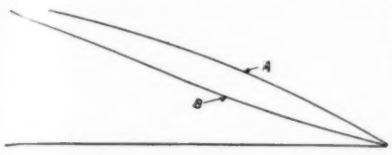


Fig. 23.—Experiments have shown that for high speed cruisers the extreme end of "the curve of areas" should be rather full and A, therefore, is a better shape than B

sired. It would be very foolish to specify an engine turning 700 r.p.m. for a cruiser making 8 knots, yet this is frequently done but with great loss of propeller efficiency. The following table gives approximately the r.p.m. that should be used with various speeds:

TABLE VII.

Speed, Knots.	R.P.M.
5-9	250-300
7	300-350
8-12	300-450
12-16	450-600
16-25	600-800
25-30	900

Revolutions greater than 1,000 should only be used in boats making 30 knots and over. The revolutions can, of course, be increased above these figures, but for the best propeller efficiency and the saving of power these values should be closely adhered to.

Another point that should be kept in mind in designing is the relation of speed and length. It is a well-known fact that the longer a boat is, the easier it is to drive; in other words, length means speed. A boat 40 feet long can be driven more advantageously at a high speed than can a boat 25 feet long. Most everyone knows what a fuss and wave disturbance is created in driving a short boat at anything over a moderate speed, but the exact relation of speed and length seems to be unknown to most amateurs. I speak of this because many boats to-day are pushed way beyond their proper speed and with a great waste of power. At those unnatural speeds the power increases very fast for small increases of speed. The customary way of comparing speed and length is to divide the speed in

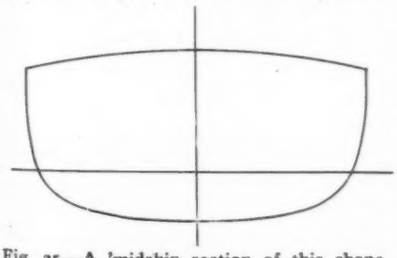


Fig. 25.—A 'midship section of this shape is too flat for a sea boat.

knots by the square root of the water-line length; that is, $V \div \sqrt{L}$. This is called the speed length ratio. Values of $V \div \sqrt{L}$ of about 1.0-1.7 are the most economical, but values as high as 2.0 and 2.3 are quite frequently found in motor boats; values higher than this should always be avoided. As a matter of interest I give Table VIII, showing the lengths, speeds and speed length ratio of a few of the latest displacement racers:

TABLE VIII.

Name.	Speed, Knots.	Length.	$V \div \sqrt{L}$
Legro-Hotchkiss	29.6	39'3"	4.73
Quicksilver	18.2	30'0"	3.32
Frene	25.7	39'8"	4.08
Nanier II	25.0	40'0"	3.95
Wolseley-Siddeley	30.4	39'4"	4.85
Dixie III	31.3	39'6"	4.94

This table shows very high values of $V \div \sqrt{L}$, values never reached except in motor boats, and then only with great power. The designer can work out these values for himself from boats which he knows to be good, economical craft—boats that go through the water with little fuss—and then select the proper speed for his new design.

The designer should also see to it that his propeller is propely located with a free run of water to it; keep it well clear of wide stern posts and always have these faired away as much as possible, to keep the eddies away from the propeller.

STABILITY.

Any person attempting a design should have some knowledge of stability if only the principles that govern it. While this is a rather long study and one that much could be written upon, I shall only attempt to point out the elementary principles as a guide to the beginner in designing. Suppose that the reader has designed a boat; how does he know it will float right side up as he plans, and if it does happen to, how does he know that it will not capsize in a seaway. Perhaps the reader has not thought much about this, and if he has, he will probably answer that other boats like his design are stable, therefore his will be. This will very often be correct, but not always, and it is a pretty poor designer who will turn out a design in this reckless fashion. I believe that a great many of the motor boats to-day would capsize very easily if they ever encountered rough water. The designer has absolutely no right whatever, whether experienced or inexperienced, to assume his design has sufficient stability until he has made some sort of a calculation. The experienced man can make these calculations quickly and roughly and know how his boat will behave; the beginner, however, must carry through his calculations more carefully, especially if his design is much of a departure from conventional designs.

It is not my purpose to enter into any long explanation of stability and the methods of determining it. I will merely give the briefest outline, and for a more complete discussion I must refer the reader to other works. The three factors entering into stability are: the vertical position of the center of buoyancy (B), the vertical position of the center of gravity (G) and a point called the metacenter (M). (See figure 26.) We saw in Part III how to find the horizontal or fore and aft position of the center of buoyancy by applying our rule to the curve of areas (see example Part III). Already we have found the areas of the various stations by dividing them up into a number of parts as shown by example with station 6, Part III. The procedure to find the vertical position of C. B. is as follows: Take the L.W.L. as an axis and divide the area up into several parts (5) (this should have been done already in finding the displacement), and take the moments of each station about the L.W.L. and sum up by rule as was done about O in the curve of areas (figure 19; see example, Part III). Now plot a curve of moments of sections exactly as the curve of areas was plotted. Find the area of this new curve of moments as was done for curve 19 (if the stations are so spaced that there is one at each end of the L.W.L. the rule can be applied directly without drawing the curve). The area of the curve of moments divided by the area of the curve of areas gives the distance of the C.B. below the L.W.L. This may seem a rather long and laborious process but as the areas of the various sections should have already been found by rule for displacement, the finding of the moments will take but a short time.

The vertical position of the center of gravity is found exactly as the method shown for finding the fore and aft position. Moments of all the weights should be taken about some point as a line through the bottom of the keel and the C.G. found, as before, by dividing the sum of the moments by the sum of the weights. Care should be taken to estimate the C.G. of the hull proper very closely as very often it is quite high, due to high cabins, as in figure 13 C.G. (G) will always fall above the C.B. in motor boats and it is only the resistance of the water-line plane to capsizing that keeps the boat upright.

The distance BM is figured from calculations on the water-line plane and laid off as in figure 26. If G falls below M the boat is stable, if it falls above M it is unstable and will capsize. GM is called the "metacenter

Fig. 24.—A hollow in the after end of the "curve of areas" will usually cause a boat to "drag" water at speed and make her difficult to steer.

height" and the greater this distance the stiffer and more stable the boat. To find B.M. find the area of the L.W.L. by applying our rule and look up the value of I, corresponding in table V, Part III. By substituting I in the following formula we obtain B.M.:

$$B.M = \frac{L \; B^3 \; I}{D}$$

where L = water line length
B = " " beam
D = displacement in cu. feet.

It will be noticed B appears as the cube in the formula and it shows the enormous effect of beam upon stability. To see how rapidly BM changes with beam, substitute in the formula a beam a foot less and again a foot greater than the designed beam and solve. This simple procedure will show the reader the great influence of beam upon stability better than anything I can write. Ballasting a boat or keeping the weights low lowers G and increases GM; increasing the beam raises M and increases GM also. GM may vary from 2 inches to somewhat more than a foot depending entirely upon the design.

There are countless other problems that come under the head of designing which the reader will meet from time to time, but the limit of this article will not permit their discussion. The designer should keep constantly on the alert to see and learn all he can about

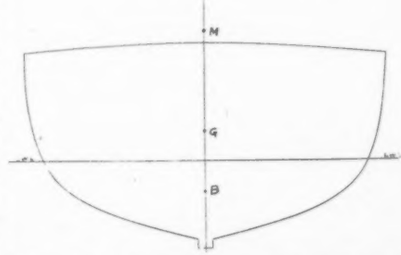


Fig. 26.—This section, taken from the illustrative design, is a much better one for a cruiser than that shown in Fig. 25.

boats and their performance, and the design, now that he knows the fundamental steps, will take care of themselves.

In closing this series of articles I would say that a good designer will turn out a boat that not only has a shipshape and clean-cut appearance, but one that will go through the water with little fuss or disturbance, and make a maximum speed with a minimum of power—a boat perfectly safe in a seaway, yet one that will roll easily and comfortably. To turn out this sort of a craft is plainly no easy undertaking.

I have endeavored to teach the beginner the simple problems that he may meet over the drawing-board—the rest can only be learned on the water and among sailors.

The Annual Meet at Monaco.

A Survey of the 160 Motor Boats that Were on Exhibition Before the Ninth Annual International Regatta. Descriptions of the Interesting Designs of Both Hulls and Engines.

By Robert Fletcher.

Special Representative of MoToR BoatinG.

The annual race meet at Monaco is the oldest and biggest event in the motor boating world. At this regatta are tried out annually the picked designs of several nations and as a study of original and often freakish boats is of the utmost interest and value. The next issue of MoToR BoatinG will contain a completely illustrated account of the races themselves and the performances of the various boats described in this article.—Editor.

OUT of 181 boats entered on the lists, about 160 are present at the ninth annual exhibition which precedes the series of races held in Monaco Bay. The exhibition is unique. In a roomy tennis court, separated from the sea by the main road, the numerous boats are lined up, each on its cradle, and can be moved about as required with the greatest ease by means of a powerful traveling crane. Rails run through the court, connecting with lines leading to the slipways, so that it is possible to draw out the biggest craft afloat with the least expenditure of labor and in the shortest possible time and, with the facilities at hand, changes can be made to the hulls and improvements carried out on the motors while the meeting is in progress. To lift out a big engine with cylinders of 6, 7 or 8 inches bore is a matter of a few seconds, and to take off the cylinders in order to examine the pistons or bearings is a task that can be accomplished between two races. So great are the facilities offered by the organizing committee, that it is no unusual thing for a large amount of experimental work to be carried out during the race fortnight, and on the opening day. Although the great majority of the boats were in thorough shipshape, there were others without engines, shaft or propellers. These could be made ready for going to sea, however, within thirty-six hours.

As usual, only a proportion of the 160 boats are really of interest from a racing standpoint. This year's modified rules provide for four distinct classes: hydroplanes, racers and cruisers aranged according to their overall length, the bore of the cylinders and total weight; and, finally, sailing yachts having an internal combustion motor as auxiliary power. Consequent on the changing of the rules, the hydroplanes (with steps) are less numerous than usual, for they comprise only three units: Motocratie, Pistil and Sigma III. The first and the last-named boats have been built by Despujols and fiitted with Panhard-Levassor motors. Sigma III belongs to M. de Soriano, and is a development of a fiddle-type hydroplane which this sportsman raced last year with a Labor motor. Then she ran as a cruiser, and in the mile and kilometer trials was but a few seconds slower than the powerful Ursula, the crack long-distance racing boat. But for a slight weakening of her motor, which was of a light aviation type, she might have done even better in the long races. Profiting by the experience gained last year, the present boat has been improved in its details, the most important change being a reduction in the height of the step, and the concaving of the formerly flat bottom. Instead of being rounded off, the bilge is square. The owner is taking no risks on the motor and has selected one of a new series produced by the Panhard-Levassor Company, being really an airship type with four separate cylinders, measuring 7.3 by 7.8 inches bore and stroke. Although specially built for boat work there is really nothing original in the motors, the general design being a standard one, modified in various details. The motor, which is fitted with copper-jacketed cylinders and has valves on opposite sides in pockets, develops 180 horsepower.

Another and more powerful hydroplane is Motocratie, built by Despujols for M. George Bariquand. She is built on practically the same lines as Sigma III, but is of greater overall length, and, instead of one, carries two Panhard Levassor motors of 180 horsepower. It is on these two boats that the French look to win the Coupe des Nations, the most important long-distance race run at Monaco, and the one that they have never been able to capture from the Britisher Ursula. In its trials on the Seine Motocratie has attained 45 knots, and, although the same speed cannot be maintained at sea, the performance is sufficiently good to justify the hope that Ursula will not have everything her own way this year.

Pistil, the third hydroplane, is not a new boat, although it is the first time she has appeared at Monaco under this name. She was built by De Korwin and, although of the fiddle type, differs from the two Despujols boats by having a finer V-section bow. Her motor is a Panhard-Levassor of 6 inches bore, originally built for a racing car and later used in the successful Tellier boat Rapiere. Tellier, it may be mentioned in passing, is now a partner with Despujols, and is jointly responsible for the production of some of the most promising looking racing craft at the meeting.

Among what are officially known as racers —though, as a matter of fact, nearly all the cruisers are racers under another name—there are 24 boats, which may be divided into pure displacement craft, disguised hydroplanes, and the English 21-footers of the sharpie type. These latter have been offered special facilities to take part in the meeting, and their interest will doubtless be confined to racing among themselves, for they appear to have little chance of running successfully against the boats of twice their size and nearly ten times their power. Ursula heads the list of the racers because of her size, her power and the work she has already done. It is the ambition of every yachtsman present to beat her; but the task will not be easy.

By her side is Tyreless III, built for the last International Cup race, and modified since then by an increase of her freeboard and the moving of her engines further astern. Last year she showed a speed of 32 knots, but, as a result of the alterations, it is believed that she can do considerably better than this. Her two motors, six-cylinder Brooks of 6½ by 8 inches bore and stroke, are on the center line of the boat, the propeller shaft of the forward engine passing out beneath the after engine, but the screws appear to be too close together for the most efficient work. She is fitted with two rudders.

All the other English boats are in the 21-foot class, and are particularly light craft, four of which have been built and engined by Brooke of Lowestoft, two by Boulton Paul and one by Saunders, with a Vauxhall engine. It will doubtless be interesting to watch them racing among themselves, but it is doubtful if they will seriously interfere with the bigger craft.

The two French racers which must be

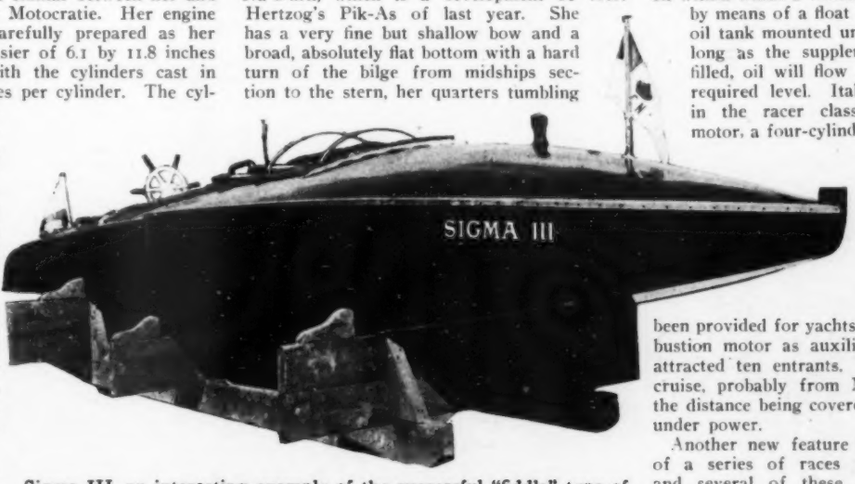
The British delegation at Monaco. Ursula, the Duke of Westminster's famous 50-footer, is shown on the left and Tyreless III, rebuilt since her visit to America, is next to her.

A general view of the exhibition grounds at Monaco, showing part of the 160 boats gathered there from several nations.

picked out as the most dangerous are Gama and Cocorico II, both by Despujols, both engined by Brasier, but radically differing in the design of their hulls. Corcorico II is a displacement boat, modeled on the lines of last year's Cocorico, and doubtless is able to stand a good deal of sea, while showing a high turn of speed. Gama, on the other hand, is what her designer terms an original boat, but which others designate a faked hydroplane. It was obvious that as soon as an attempt was made to separate hydroplanes from displacement boats and to elaborate a rigid rule, defining a gliding craft, designers would get as near to the forbidden ground as possible, without actually trespassing on it. Gama is an example. She is a flat-bottomed boat, intended to glide at high speed; but she has no step, and is, therefore, a "displacement" craft. Forward her sections are V-shaped and slightly concave, but they gradually merge into perfect U-sections with a broad flat bottom, and immediately after the midship section the width of the boat is decreased and the sides are tumbled home. Of course, ignoring the step, there is much that is similar between her and the pure hydroplane Motocratie. Her engine has been just as carefully prepared as her hull, for it is a Brasier of 6.1 by 11.8 inches bore and stroke, with the cylinders cast in pairs and four valves per cylinder. The cylinders are of the L-type, the two exhaust valves being operated from below and the two intakes by means of a rocker arm with forked ends, so that one pushrod serves for two valves. The motor has been most carefully prepared for the meeting and develops 180 h.p. at 900 revolutions. An identical motor is found on the Cocorico II.

Despujols has three other boats, belonging to the Saurer Automobile Company, a firm having its headquarters in Switzerland, with factories in France and America, and all three are fitted with a special series of motors built by them for boat racing. The motors are four-cylinder models in pairs, measuring 5.1 by 9.8 inches bore and stroke, and having valves mounted vertically in the head and operated by rocker arms from camshafts and pushrods on opposite sides. Annette-Saurer and Saurer-Despujols have identical lines, their characteristics being a flat bottom for about two-thirds of the length, and a shallow V-section displacement type of bow, very similar to the Gama. The third boat with a Saurer motor is Bonne Fortune, a fast seagoing cruiser with very fine lines.

Pitted against these two French semi-hydroplanes is a German boat with an identical Saurer motor. There is a considerable difference in the lines, for the German craft, Saurer I, has finer V-sections forward, the turn of the bilge is not rounded off and she sweeps in abruptly immediately after the midship section. Another German boat of note is Pikas-Na-Durk, which is a development of Herr Hertzog's Pik-As of last year. She has a very fine but shallow bow and a broad, absolutely flat bottom with a hard turn of the bilge from midships section to the stern, her quarters tumbling home sharply. Her motor, a powerful four-cylinder Dürkopp, stands high out of the open cockpit, giving to the boat a dangerous appearance of top heaviness.

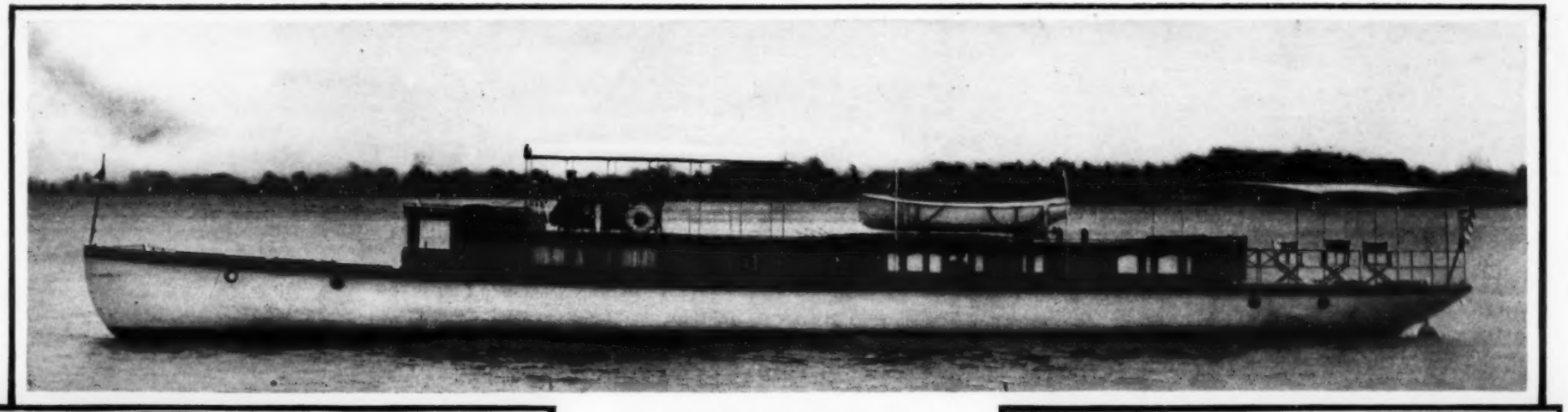


Sigma III, an interesting example of the successful "fiddle" type of hydroplane and a re nement of the famous Sigma Labor.

The most curious boats are Labor-Garonne II, Nautilus X, Garonne-Labor and Mais-Je-Vais-Piquer, which might summarily be described as punts with high concave sides to which a short V-section bow has been added. In smooth water they should be fast, but it is difficult to believe that they will prove satisfactory in a sea. Nautilus X and Mais-Je-Vais-Piquer have an interesting type of new motor produced by Picker. The four cylinders of 5 by 9.8 inches bore and stroke are in one casting, and are really a finely compact piece of work, with the valves on opposite sides having their stems inclined outwards so as to diminish the size of the combustion chamber. A high pressure of oil is fed to the three main bearings and the connecting-rod ends, and in order that a plentiful supply of lubricant may be carried, the base of the crank chamber forming an oil sump is circular and has a detachable bottom. This gives a deep barrel of oil within which a constant level is maintained by means of a float from a supplementary oil tank mounted under the gunwale. As long as the supplementary tank is kept filled, oil will flow into the sump to the required level. Italy has only one boat in the racer class, and although her motor, a four-cylinder monobloc Fiat with enclosed overhead valves, is a remarkably fine piece of work, the design of the hull appears to be really too heavy for fast work.

For the first time a special class has been provided for yachts with an internal combustion motor as auxiliary power, and has attracted ten entrants. Their test will be a cruise, probably from Monaco to Nice, half the distance being covered under sail and half under power.

Another new feature has been the holding of a series of races for hydro-aeroplanes, and several of these interesting craft are shown in the photographs on page 10.



VIKING.

A 95-Footer Originally Equipped with a 1000 Horse Power Steam Plant Recently Converted to Gasoline. An interesting Example of the Advantages of the Internal Combustion Motor.

CONVERTING a 1000-h.p. steam yacht into a 150-h.p. motor yacht is quite a novelty even in this stage of popularity of motor boats, but this was done and with great success in Viking, a 95-foot craft belonging to Mr. C. J. Mulford, of Detroit, Mich., and designed and built by Peter Suder of the same city.

This yacht was at the time of her building one of the fastest steam yachts on the Great Lakes and, in spite of the fact that she burned crude oil for fuel, her power plant occupied 24 feet, or approximately one-quarter of her hull length, and weighed 20,000 pounds.

The convenient arrangement of the pilot house and duplicate steering equipment.

When Mr. Mulford purchased the hull of the Viking, or Hornet as she was then called, the entire boat was gone over thoroughly and in places reconstructed, especially in the matter of arranging the cabins, staterooms, etc., so that the present boat is one of the most comfortably arranged of any in commission in the vicinity of Detroit.

A noticeable feature after her power equipment was changed was the fact that her three Gray motors which were installed and which drive triple screws occupied a space of but 4½ feet fore and aft in the hull and weighed only 2400 pounds, or about one-eighth of the steam power plant. This equipment gives her a speed of 13½ miles per hour, which is somewhat less than her old speed, but her accommodations have been increased to a very large extent.

The crew's quarters are located below the forward deck and the steering equipment is a combination arrangement, allowing the boat to be controlled either from the bridge, as shown in the upper photograph, or from the pilot house, as shown in the lower photograph on the left. The forward cabin and the owner's private quarters are all finishd in white enamel, with the after cabin in oak. The after cabin is provided with lounging seats finished in leather and provides roomy accommodation formerly occupied by much of the steam power plant.

The generating set that furnishes current for thirty 16-candlepower lights.

The vessel is fully equipped with a galley and meals may be served in the after cabin. The after deck is covered with a canopy and allows space for a number of chairs. There is also deck space provided upon the bridge.

Viking has her own electric lighting plant driven by a separate Gray motor and is completely equipped. A glance at the photographs will show the large roomy engine room and will reveal the fact that the weight is kept down low, at the same time allowing good light to all parts of each motor. These are much more accessible than the steam plant and the owner of Viking has procured excellent results both as to speed and reliability from this equipment.

The three Gray motors occupy one-sixth the space of the steam plant and drive her at the rate of 13½ miles an hour.

Bulkhead Control Up-to-Date.

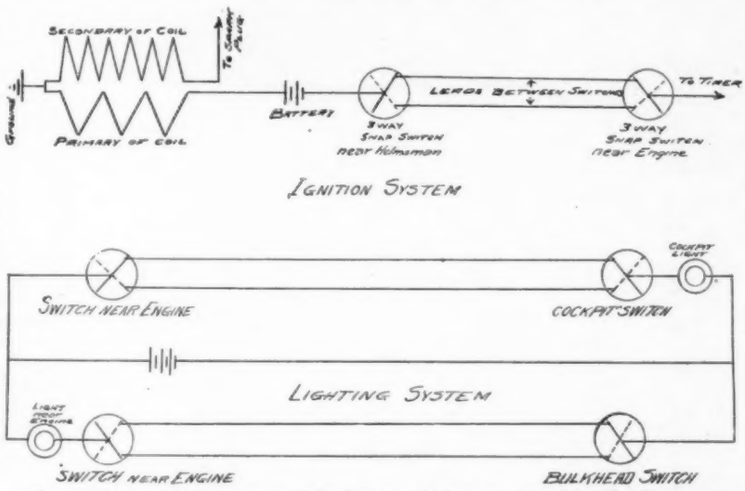
A Discussion of the Arrangement of the Steering Gear and Engine Controls to Facilitate the Handling of a Boat by One Man.

By C. F. Chapman.

(*Continued from page 9.*)

to that on the 50-foot twin screw cruiser on which 20 different pieces of apparatus are brought out, each having its own proper share of work to perform toward the successful operation of the whole as a well-balanced machine.

The tendency is growing to make the boat steer in the same direction that the steering wheel is turned, although this is contrary to standard practice on sailing ships and on steam vessels navigating on the rivers, bays and sounds. The coastwise steamers and those on inland waterways generally turn in the direction that the wheel is put and this appears to the novice to be the most natural way it should operate. Probably the custom of having the wheel act in the opposite direction to the course of the ship dates back to the time when they were almost exclusively handled by means of tillers, which, of course, must act in the opposite direction. The horizontal wheel is the cause of the tendency to change the direction in the motor boat practice and there appears to be a much more natural effort to turn this type of wheel in the direction one wishes to steer than with the old vertical wheel. However, the direction of turning is not of a great deal of importance as anyone will readily adapt himself to either method after a little practice. The old method of the "opposite turning wheel" has one point in its favor and that is when an order is given to port the helm it is simply necessary to throw the wheel to port, while should the boat steer in the same direction as the wheel turns, then to port your helm you must remember to put your wheel to starboard. It should always be remembered that when you port your helm the boat goes to starboard and vice-versa.



Diagrams for wiring systems of duplicate switches suggested by Mr. Chapman.

The position of the steering wheel in reference to the helmsman's position is of the greatest importance and the practice of making its position adjustable, as is now being done, is a real improvement. When standing at the wheel it should be at such a height as to allow one to take a naturally easy position and when sitting it should be out of the way of the legs and knees. Usually the height of the horizontal wheel is adjustable, being held in any desired position by means of a lock nut. In a sea-way or where considerable effort is required in steering or where one must remain at the wheel for long periods of time the horizontal wheel is not to be recommended. The weight of the body can be applied with greater advantage to a vertical wheel and the knees can be used to hold the wheel in position or turn it a spoke or two to keep the boat on her course.

The drum on the vertical wheel should be not less than 3 inches in diameter in any case. Most of those on stock boats are entirely too small, averaging not far from 1½ inches diameter over the part on which the tiller line winds. It would take 6½ turns of the steering wheel to put the rudder from hard to the port to hard starboard using a drum of this size and a 10-inch tiller. Three turns are all that should be allowed and with a 3-inch drum one complete turn of the wheel is sufficient to turn the rudder from amidship through about 60°, which is a large enough working angle.

The horizontal wheels sometimes use a wooden drum but more often are fitted with a gear and rack. The rack should be not less than 20 inches in length, which would allow a 10-inch tiller about 120° swing. It is very often an excellent idea, when racks are used, to adjust the tiller lines so that when the rudder is amidship the rack will not be equally spaced each side of the gear. More of the rack should be left to the part of the gear, say in the ratio of about 12 inches to the port and 8 inches to starboard, provided, of course, that the boat steers in the same direction as the wheel is turned and that a right hand propeller is used. This will tend to counteract the effect of the difference in turning due to the variation in density of the water at the top and bottom of the propeller, which causes the boat to tend to turn in a circle to the left while going ahead with the rudder amidship, that is, as the boat requires a port helm to keep her straight the rack will then be evenly spaced and allow a more balanced turning radius. In order to have the boat steer in the same direction as the wheel turns and not have the tiller lines crossed, the rack should engage the forward half of the gear causing it to move "with" the forward part of the steering wheel. When it is desired to have the boat steer "against" the wheel, have the rack aft of the gear on the steering wheel shaft or cross the tiller lines aft near the rudder head.

Some boats, notably the Hankscraft shown herewith, have the steering wheel and a rear starter embodied together, that is, when the wheel is pushed forward close to the bulkhead it disconnects from the steering gear and connects with the starting chain, operating a ratchet sprocket on a shaft between motor and reverse gear. When the engine starts the wheel is automatically returned to its normal position, controlling the steering gear.

The controls to the engine throttle and spark adjustment are now found on a majority of open boats and cruisers and even the home-made ones show much ingenuity in design. Even when the bulkhead or steering wheel is located at some distance from the engine it is not a difficult matter to make the necessary connections by means of a ¼-inch brass rod and suitable bell cranks and levers.

Often soft copper wire or flexible picture wire is used to connect the spark and throttle to a point near the helmsman or engineer, employing a spring on the carburetor and timer to bring these back to the initial position when the tension on the wire is released. Such an arrangement is very unsatisfactory, as the wire stretches and is apt to break, thus stopping the engine or speeding it up at the wrong time. The adjustment of speed can seldom be made the same, twice in succession, and one is apt to pull or lean against the wires unintentionally almost any time. All of the difficulties can be overcome by the use of rods and levers.

Usually both throttle and spark are brought out together on one fixture with two levers, but this is quite unnecessary on make-and-break, slow speed engines, as the range of the spark adjustment on this type of engine is so small as to be practically fixed for both slow and fast running, thus requiring only the attachment for regulating the amount of mixture to be brought to the steering wheel or bulkhead. Most of the controls found to-day in the open runabout are brought up through the hollow steering wheel shaft to the top of the wheel, although some are kept on the underside of the wheel. One lever is controlled by a brass rod which passes up through a brass tube on which the other lever is clamped.

On many open boats a vertical type of control is used on the bulkhead, especially when the engine is directly forward of the controls. By using this type the intermediate levers and bell cranks can be dispensed with and connection made direct to the carburetor and timer in many cases. Care should be taken that the controls are not placed in a position so that clothing will catch on the projecting handles and cause trouble by suddenly changing the adjustment.

The bell cranks should be adjustable to any desired angle rather than those that are fixed at 90° and the work of installation will be greatly lessened. These can be easily made by sawing them out of ⅛-inch sheet brass and fastening them together at the proper angle by means of brass bolts.

One of the photographs shows a very neat device for getting away from the old cramped up spray hood, with its open "peek hole" just large enough for one eye to see out of, by the substitution of a form of the automobile wind shield. There are not many improvements that we can borrow from our cousins, the automobiles, yet it is hard to see why the old type of spray hood has proved so popular except for rain and a temporary cabin, for an open boat.

The electrical instruments on the bulkhead or near the helmsman offer many possibilities for convenient arrangements and may be made more or less elaborate according to the whims of the owner.

One of the inconveniences caused by most of the wiring systems I have noticed seems to be that generally two switches are provided in series for the ignition system, one placed near the helmsman and one near the engine or in some other part of the boat, where it may be desired, to be able to stop the boat without going to the place where only one switch would be located. Naturally to start the engine both of these switches must be

(*Continued on page 74*).

How to Build a Hydro-Runabout.

A Twenty-Footer that will Climb Out and Plane with Thirty Horse Power, but so Designed as to be Easily Driven at Moderate Speeds.

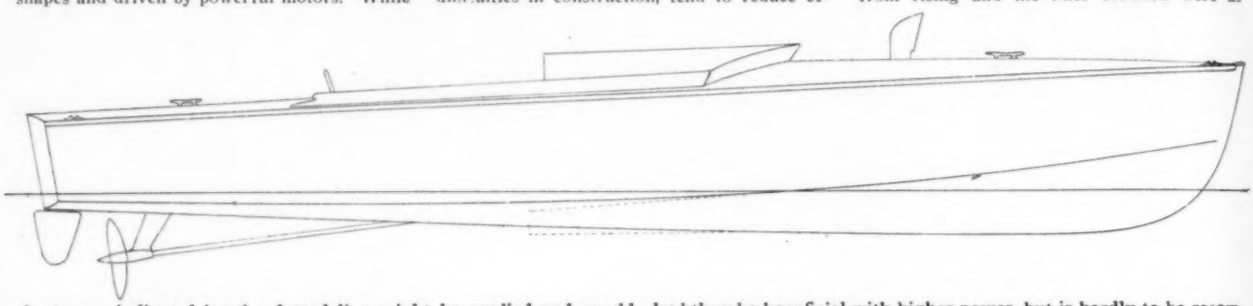
By Frederick K. Lord.

In talking over the question of what kind of a boat was most in demand right now, we came to the conclusion that one which could be used successfully either for racing or for everyday runabout service most nearly filled the bill. The average man wants an all-'round boat, but the requirement of speed is becoming more and more important. With these facts in mind, Mr. Lord went to work and we believe has succeeded in producing a little masterpiece. The boat was designed to plane well with only thirty horsepower and steps were purposely avoided, as their doubtful value with such small power is more than overbalanced by the fact that they make the boat hard to drive at lower speeds.—Editor.

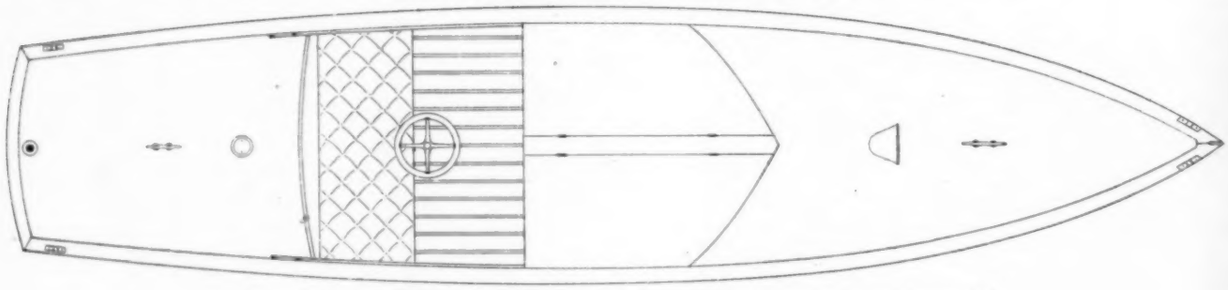
THE recent introduction of the hydroplane has greatly stimulated the interest in small high-speed boats. This has resulted in the production of many curious craft generally fitted with lifting planes of various shapes and driven by powerful motors. While many of these boats showed high speed yet their seaworthiness and action in rough water left much to be desired and the fast hydroplane that can slow down in rough water and compare in action with a first-class displacement boat, is yet to be built.

The necessity for this may not be great in a large boat, but it is in a small one, as it is often impossible to drive them in the relatively heavy seas they may get caught out in. The ideal small fast boat of the future will probably be one that, in reasonably rough water can rise and skim and when it is too rough, settle down and drive with efficiency and seaworthiness equal to the displacement type. As many characteristics in design which are favorable to speed tend to reduce seaworthiness, the problem is a difficult one and will take time to solve. The use of jogs on applied planes is objectionable as they offer difficulties in construction, tend to reduce efficiency at normal displacement speeds, are a source of worry when docking and enhance the chance of leaks.

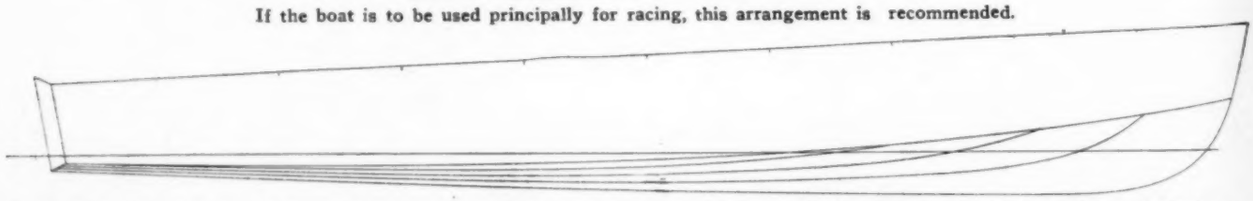
In the early days of high-speed displacement boats every effort was made to keep the bow from rising and the lines forward were as sharp as possible in order to reduce the lifting tendency. As wave-making resistance was great the long, slim hull tended to keep this down. Motors were placed well forward and the boat trimmed by the head at rest. The result was that by not allowing the boat to rise and relieve herself of the excessive pressures forward, she ploughed along and created a large bow wave. Finally the engines installed in the smaller craft grew so powerful that it was found impossible to keep the boat on her lines and her bow would come out anyhow and that the speed increased. It was here that the phenomenon known as hydroplaning commenced and its importance at that time was



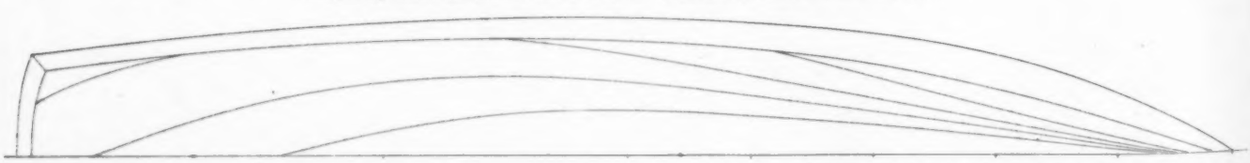
A step as indicated by the dotted line might be applied and would doubtless be beneficial with higher power, but is hardly to be recommended if a thirty-horse motor is to be installed.



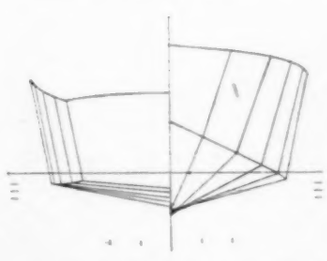
If the boat is to be used principally for racing, this arrangement is recommended.



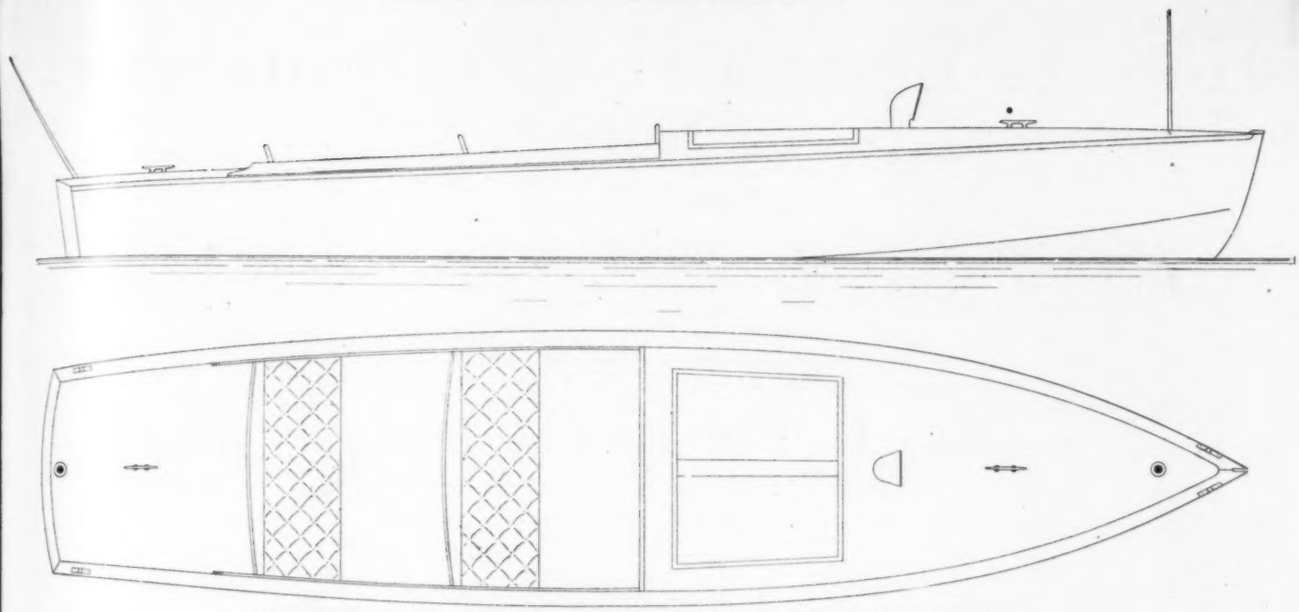
In analyzing the designs of the most successful speed boats of the past few years, Mr. Lord found that the one point of similarity was flat, easy buttock lines, which are a noticeable feature of this design.



The underbody is slightly V-shaped throughout the entire length, which will make her a better acting craft in rough water than the average monoplane type.



There is nothing freakish about her body plan.



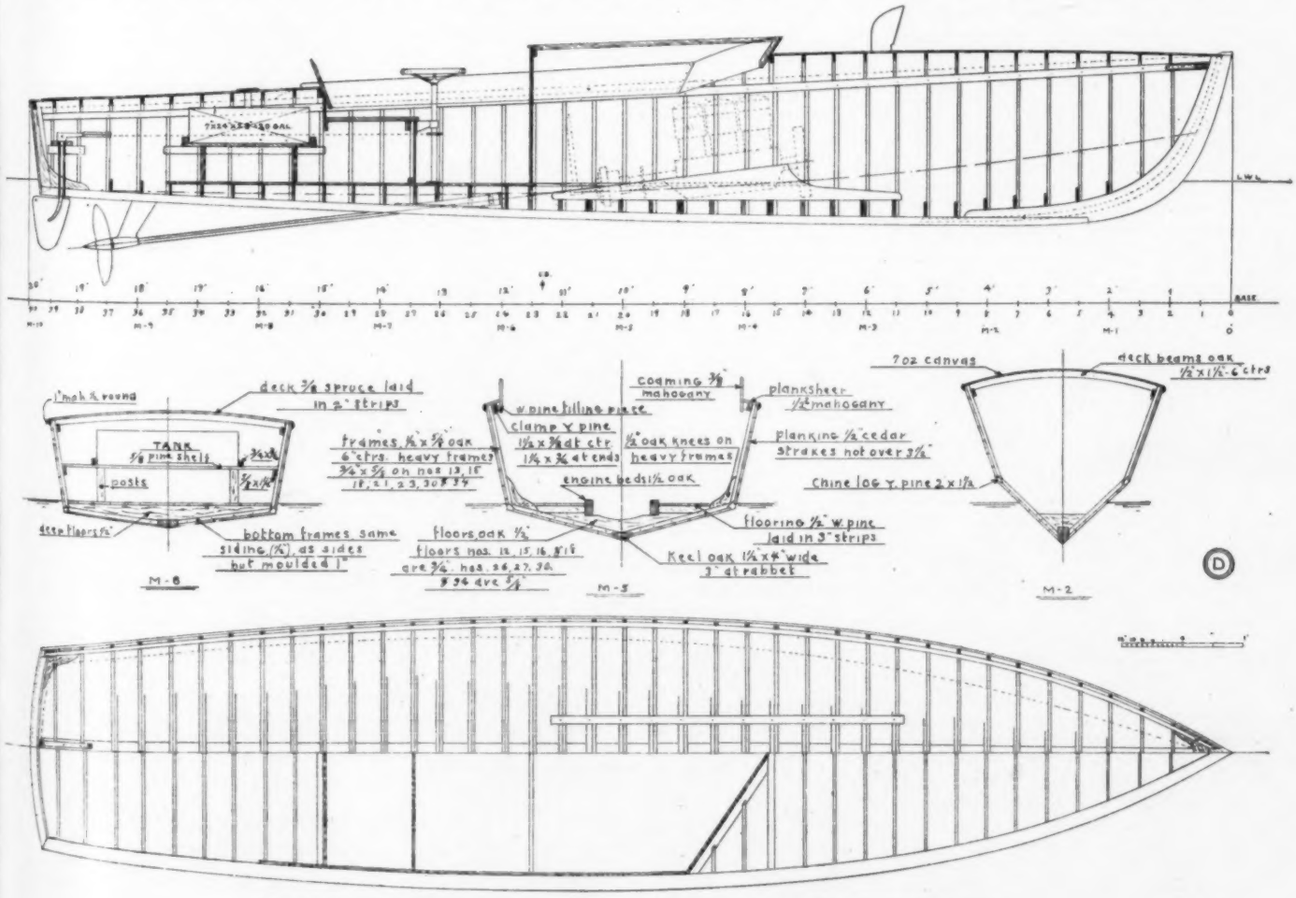
This arrangement is suggested for the boat that is to be used as a family runabout.

not fully realized or used most advantageously.

Subsequent knowledge often clears up a great many things not previously understood. In trying to determine the best form for speed the writer several years ago analyzed the lines of many noted speed boats to see if they had any characteristics in common. He only found one; all the best ones had very easy and flat buttocks and were unlike each other in every other way. These boats also ran with their bows slightly out and the angle that their buttocks made with the water forward was small. In other words, these boats were the best shaped for hydroplaning and were doing it to a considerable degree.

The practical solution of the aeroplane stimulated people to try the same idea on a boat with the result that we are rapidly learning the effect of the principle as applied to hulls. We now know that the faster a boat is driven the more she tends to rise and skim over the surface of the water; and that anything that will aggravate that tendency without excessive head-on resistance will result in more speed. Heretofore great attention was given to the shape of waterlines and diagonals, but, as we now know that the water passes practically straight under the hull, we devote ourselves to getting the buttock lines just right. In other words, upon the shape and character of the bottom and the angle it presents to the water when running depends the efficiency of the boat as regards speed. Of course, there are many other things bearing on the problem that will not be discussed in this article and the above points are inserted as perhaps being of interest.

Reverting back to the original idea of a boat capable of running efficiently, either in the dis-



The boat is lightly built and relies upon this fact for her speed with small power.

placement or by hydroplaning condition, there are several characteristics which must be incorporated in a successful design. When running at low speed the hull should drive easily, rise readily to large waves and be easy of motion and reasonably free from spray. When driven at high speed the boat should rise readily and skim, have stability and steadiness and steer well without erratic action. There is a demand for a small boat having the above characteristics, fitted with moderate power, low in cost and easy enough for the enthusiastic amateur to build. It is to meet these requirements that the design herewith is presented and the following are some suggestions on building such a boat:

The boat is 20 feet over all, 4½ ft. beam and intended to be fitted with a three-cylinder 4½ x 4½ two-cycle 30 h.p. motor, weighing complete with reverse gear not over 325 lbs. This with two persons aboard should give 23 miles per hour, or better. An alternate plan, allowing room for four persons, is shown but not recommended where speed and liveliness are desired unless more power is installed. It is better to build the boat just as she is shown and not make any changes whatever. If you do not like her as she is then I advise you to let her alone and use some other design. Shifting around weights and using different sizes of motors generally results in dissatisfaction sooner or later.

The boat is light and small, relying on that fact to get her speed with small power; you can't lug weight unless you have ample power. As far as design goes the bottom is sharp enough to prevent bad pounding and has lines which will allow her to rise out readily. For extreme speed the addition of a plane may be beneficial, but for the power suggested its advantage is doubtful. A plane 3½ feet long, 2 inches deep on after or bilge edge and 1½ inches at keel, made of ½-inch mahogany suitably backed and protected on its fore edge by sheet brass might be tried. The after edge of the plane should be 8 feet from the transom.

(To be concluded.)

The Classification of Speed Boats.

Suggestions for Bettering the Situation which the Coming of the Hydroplane has Made Impossible. A Letter From the President of the A. P. B. A.

By H. T. Koerner,

President American Power Boat Association.

The poor old rules of the A. P. B. A. have been the butt of many a jest and criticism lately, because of their inability to make team mates of the hydroplane and the displacement boat. With the cruisers the rule has worked remarkably well, but the results of their use in modern speed boat racing are ludicrous and the time for a change is already overdue. The western method of classification according to length is no better able to cope with the situation, and whether our future classes will be based on actual performance or whether the solution will come through the engine by limiting piston displacement, it is hard to predict. Mr. Koerner advocates the former method and his views should be of interest to all those interested in motor boat racing.—Editor.

ON my return to the United States I found a curious situation developing with considerable rapidity as related to motor boat racing. That the premonitory signs all pointed to such a development, no one conversant with the activities of the sport can very well deny. That some of the remedies suggested by legerdemain radicals, if put into operation, would result in a condition far worse than the real ailment, is patent on its face. There is no doubt of the need of meeting the changed conditions brought about by the phenomenal development of the modern boat for racing. The advent of the so-called hydroplane has precipitated the whole question into an active and immediate call for decisive action. Hitherto high-speed boats were relegated to classes according to length, irrespective of the power of the engines, and usually raced in scratch races, the first boat in being the winner. With the advent of the hydroplane, this simple and satisfactory method of racing has resolved itself into a farce. A 20-foot hydroplane to-day can equal the speed, and, in fact, has proven the superior of boats 26, 32 and even 40 feet, and has left the displacement boat in a position where it is impossible to compete at all.

The old rules of the American Power Boat Association have proven entirely inadequate to cope with the new situation and are, of course, obsolete. The Western method of racing by classes, based on length irrespective of power, will also be completely inoperative through the rapid development of the hydroplane. There is no rule, no method, nothing tangible in view to properly place the hydroplane of varying size and horsepower, but of equal speed. No interminable string of figures, no mathematical calculations and nothing the human mind is capable of formulating at present seems to cover the ground or fit the case. The definition of "What is a Hydroplane?" as submitted by a special committee, consisting of W. H. Fauber, Clinton H. Crane, Henry J. Gielow, R. B. Clark, George F. Crouch, M. M. Whitaker and Irwin Chase, who were appointed at the annual meeting of the A. P. B. A., follows:

"A hydroplane is defined as a racing boat, whose propeller acts in or against the water, which has one or more of the following characteristics: (a) One or more breaks in the longitudinal continuity of the immersed surface, or one or more superimposed lifting surfaces; (b) an immersed area of transom exceeding 33 per cent. of the immersed midship section, taken at 50 per cent. of the load waterline length; (c) a rating under 1912 A. P. B. A. rules exceeding 16 times the square root of the load waterline length. Immersed areas shall be actual areas, taken with the boat at rest and the crew aboard in their racing positions. If by virtue of any peculiar form of stern it is impossible to measure the immersed area of the transom, the maximum of submerged width at any point within 15 per cent. of the overall length from the stern shall be multiplied by the maximum draft at any point within 15 per cent. of the overall length of the stern and the product shall be taken as the area of the transom."

The report clearly indicates the difficulties which clubs will have in measuring the boats belonging to members. One can easily imagine the correctness with which hydroplanes in the North, South, East and West will be "measured." Also the storm of protests that will result when the hydroplanes from various sections meet at a common center of racing! The guarded denunciation of the old A. P. B. A. rules will be as a summer zephyr compared with the outbursts that would certainly ensue—and for what? To try by theory what can be demonstrated by fact; to endeavor to fix arbitrarily that which can be demonstrated by the simple process of trial.

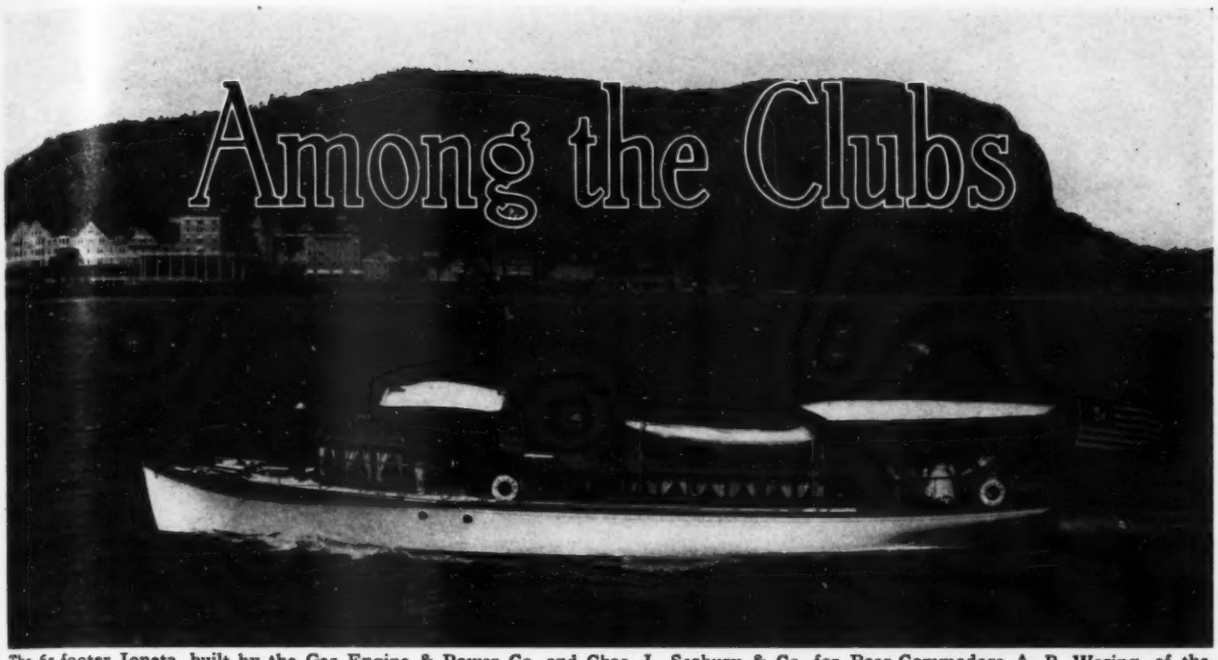
But one more obstacle in the way of simple racing for enthusiastic but inexpert racing men and clubs—in passing: a rule to be a success must be a rule understood by those who race—(*sic*) the laymen, not the professional. A rule formulated by a scientific technical body of men may be theoretically perfect, but absolutely impossible in practical operation, and certainly wholly beyond the comprehension of the average supporter of the sport. It is farthest from my intention to detract from the work done by the expert and efficient committee, many of whom are my personal friends, but candor compels a protest against the scientific result achieved in defining a hydroplane, purely from the standpoint of practical operation. The hydroplane, like the horse, should have its speed class. A 15-foot boat of this description, capable of making 30 miles, belongs in the 30-mile class. A 30-foot hydroplane, capable of making 30 miles, belongs in the same class. A 40-foot boat of similar construction, of 30 miles speed, likewise belongs in the 30-mile class. These boats should race together whether they are square, round or triangular, whether they have one or more planes, superimposed or superabundant

Into what other class does a 30-mile boat belong if not in the 30-mile class? The Percheron horse, 2/10, has no advantage over the little wiry mustang 2/10! His relatively greater muscular power is compensated by his proportionately heavier bulk. The argument against the speed classes generally resolves itself into the ever-present "human equation," namely, jockeying of the man in operating the craft. If motor boat men can invent any tricks or give any points that have not been tried in horseracing, they ought to be unhesitatingly placed into the niche reserved for the Eighth Wonder of the World.

With the advent of new principles applied to boat construction let us simplify not augment the conditions that have been found intolerable. Let the old rules of the A. P. B. A. stand in the classes where they have been found especially valuable, as in the cruiser classes, but let us steer as far away as possible from the mathematical shoals that have wrecked not only many a friendship but many a disposition in the past. If motor boat racing can be reduced to the simplest form, it will be accomplishing that which the vast majority of racing boat men have been longing for. It will be the most potent factor in establishing that which has deterred so many men from entering the extreme speed racing field. It will give continuity to the value of a racing boat and insure its use for an indefinite period, in its own particular class, instead of being relegated to the scrap heap as a worthless asset after a defeat by a boat not in her class and with which she never should have raced.

The American Power Boat Association can well afford to take the lead in this advanced and attractive program. It simply must take the initiative in establishing a National Board of Control to whom shall be referred all ultimate questions of racing, protests and records. It must also definitely settle the status of the professional, reconstruct its constitution and by-laws and revise its entire rules for racing to meet the changed conditions that are so obviously in need of it. The council of the association will meet soon and the result of their deliberations will be submitted to a general meeting of the association four weeks later for final settlement. It is a foregone conclusion that these observations will be received with much opposition, and that they will be subjected to much criticism, yet the writer feels that his justification lies in the fact, so apparent on all sides, that the time has come for a radical reform.

Among the Clubs



The 65-footer Ioneta, built by the Gas Engine & Power Co. and Chas. L. Seabury & Co. for Rear-Commodore A R Waring, of the Moosehead Lake Yacht Club. The illustration shows the Ioneta passing Kineo House on Moosehead Lake.

The Cleveland Powerboat Club, Cleveland, Ohio, opened its new club rooms on the second floor of the Adella Block, 454 East 105th Street, on March 28th, when an informal smoker was held for members and their friends. The new rooms include a large hall which can be used both for an assembly room and as a dancing floor and several smaller rooms which will be utilized for committee purposes and will also be fixed up as lounging rooms for members. From these rooms there is an excellent view of the lake for a long distance. The opening evening brought a large turn-out of members who thoroughly enjoyed the interesting program provided for their entertainment. The evening was concluded with refreshments.

The Petoskey Motor Boat Club, Petoskey, Mich., decided at a special meeting to hold a motor boat regatta and week of sports on Little Traverse Bay, from July 29 to August 3, inclusive. In addition to the motor boat races there will be contests for canoes and other craft and it is hoped to have an aeroplane for exhibition flights. The committee appointed to arrange the affair consists of the following members: Will Cartwright, Lyman Merrill, Frank French, Roy Comstock, John Quinlan, John Foley, Aaron Parker, Lorenzo McManus, Philip Braun, Clyde Varnuum and Bruce Wachtel. It is intended to make the affair an annual event.

The Lakewood Yacht Club, Rocky River, Ohio, held its annual theatrical entertainment at the Cleveland Theatre, April 19th and 20th. The entertainment consisted of a minstrel show followed by a one-act musical comedy, built around the rivalry between power boat men and sailors. At the regular March meeting of the club, a motion was made and carried that the warning weather pennant for small craft as designated by the U. S. Weather Bureau be displayed from the club flagstaff. This pennant is hoisted upon receipt of notice from the Weather Bureau that winds are expected which will be dangerous for small craft but not of sufficient force to affect high-powered vessels. The following officers were recently elected for 1912: Commodore, Albert Y. Gowen; vice-commodore, F. B. Richards; rear-commodore, G. F. Burrows; secretary, Byron B. Brockway; treasurer, Cary R. Alburn; directors for three years: A. Y. Gowen, A. A. Augustus, G. H. Gardner. The commodore appointed Dr. W. H. Kinnicutt, fleet surgeon, and Otto Nehrenst, fleet captain.

The Carondelet Motor Boat Club, of St. Louis, Mo., at its annual dinner held at the club quarters a short time ago, installed the following officers: Dr. M. C. Starkloff, commodore; John H. Quirk, vice-commodore; O. R. Van Kleeck, rear-commodore; J. M. Haas, financial secretary; Wm. Rudolph, Jr., recording secretary; A. Courvoisier, treasurer.

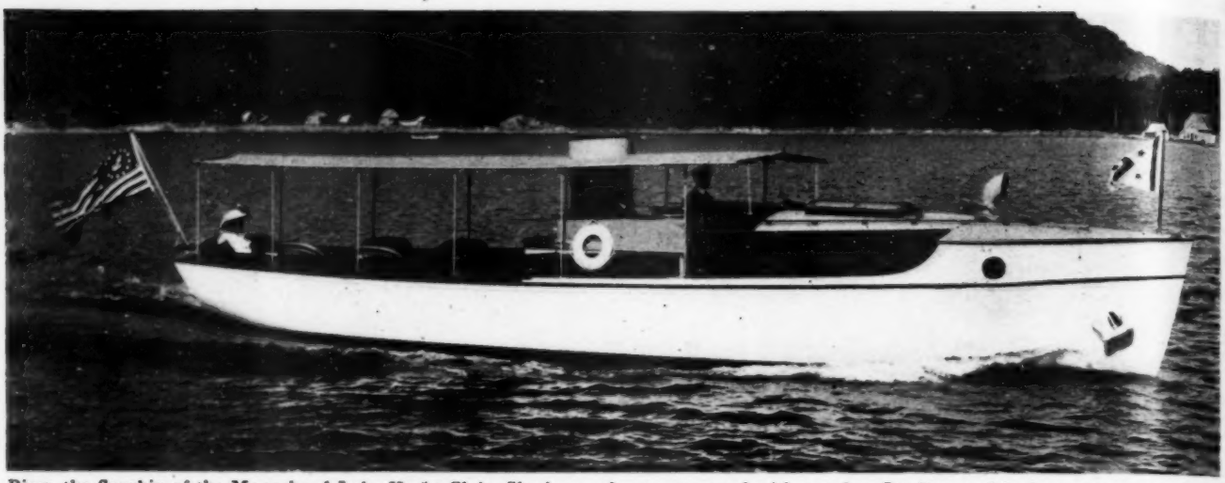
The Motor Yacht Club of Germany.

German motor boat racing, which has suffered a temporary slump since 1908, is now practically in the hands of the Motor Yacht Club of Germany. This club was founded in 1907 by secessionists from the German Motor Boat Club, which had its birth in the preceding year. The reason for the split was the objection of a number of the members of the German Motor Boat Club to remain in an organization which was little more than a sub-committee of the Imperial Automobile Club. Even this action, however, did not free the boatmen entirely from the sway of the motor car organization, for the land association with only 45 boats on its register, commands no fewer than 25 votes at the meetings of the German Motor Yacht Association, while the Motor Yacht Club, whose fleet numbers over 160 craft, has but a poor three. To comprehend this phenomenon, it must be explained that the nine clubs constituting the Motor Yacht Association have a voting power based on membership rather than on the number of boats owned, an arrangement the absurdity of which is well illustrated by the fact that the North German Automobile Club, which possesses no boats at all, although it is a member of the association, has just as many votes as the Motor Yacht Club of Germany. Thanks to the energy of its first secretary, Naval Lieutenant Rasch, who has already had two successors, both naval men, the Motor Yacht Club has flourished. In particular, the club has done much to promote the building of rough-water craft and has been in a position to offer some really valuable prizes for contests confined to this type of vessel. The most important cruising event so far was the German-Austrian Elbe run, organized and carried out last year with the co-operation of the Austrian Motor Boat Club. The start was at Leitmeritz, in Austria, and the finish at Berlin. The cruise had the distinguished patronage of the Crown Prince of Germany over the German section and Austrian notables lent their countenance to the event while the boats were in that country. The Lake Constance meetings of the club occupy a prominent place in the annals of German motor boating, although they have not escaped the effects of the general decline in racing mentioned above. The Motor Yacht Club has at present some 300 members, over whom Rear-Admiral Aschenborn presides as acting president. The club headquarters are in Charlottenburg, near Berlin, for, despite its boating strength, the organization has no water-side club house.

The Pacific International Powerboat Association decided at a meeting of the executive council to start the 1912 long distance motor cruising race at Vancouver, B. C., on Monday, July 1st. The boats may start any time between 10 A. M. and 4 P. M., to take advantage of any tides which the skippers may have figured on in their course. The racers will go down the Gulf of Georgia, across the strait to a stake boat in Port Angeles harbor, back up the Strait, around Port Wilson, down the west side of Vashon Island, up the east and down the west again, making a complete circuit of the Island and finish at the Tacoma Yacht Club. This gives a course over 225 miles long, with enough variations of water to give the racers a thorough testing out. At the same meeting, the Pacific Coast championship races for speed boats were awarded to the Astoria Motor Boat Club of Astoria, Ore., and the dates have been fixed for August 22nd, 23rd and 24th. It was decided not to hold races for smaller craft on this occasion, as has been done heretofore. The Puget Sound speed boat championships will be held on Lake Whatcom in July, under the auspices of the Lake Whatcom Motor Boat Club of Bellingham. The following were selected to form a committee for the supervision of the races of the association during the coming summer: A. V. Comings and Fred Brinton, of Seattle, and Major Hulme, of Vancouver.

The Crescent Athletic Club, of Brooklyn, N. Y., has decided to pay more attention to motor boat racing this year and will hold two regattas off the country house at Bay Ridge. The dates for the sea races will be June 15th and September 14th, and it is stated that these will include events for cruising yachts, speed boats and motor boats of moderate power, although the full program has not been officially announced. Commodore Edgar F. Luckenback, Vice-Commodore Chas. Lembcke and Rear-Commodore G. G. McIntosh have been renominated as flag officers of the club.

The Portland Power Boat Association, of Portland, Me., at the annual meeting held a short time ago, elected Ervin A. Clark commodore for his fifth term. Other officers chosen at the same time were: Chas. Schonland, vice-commodore; C. S. Winslow, secretary; E. E. Crocker, treasurer, and Roscoe Brown, trustee for three years. The annual cruise of the association will probably start from Boothbay Harbor on July 3rd, making the first day's run to Port Clyde and proceeding to Camden on the following day, where the boats will remain until Sunday and then start back for their respective home ports. It is expected that the Kennebec Yacht Club, of Bath, the Augusta Yacht Club, the Boothbay Yacht Club and the Casco Bay Yacht Club will take part in the cruise.



Biwa, the flagship of the Moosehead Lake Yacht Club. She is a 42-footer, powered with a 30-h.p. Sterling, and is the property of J. Reilly, Jr., of Salem, N. J.

The Sacramento Boat Club, of Sacramento, Cal., has fixed on May 19th as the date for its annual regatta. There will be the usual races for motor boats, rowing races between a local crew and the crew of the University of California and individual rowing events. Other dates for the summer have been arranged for as follows: May 12th, club run to Elkhorn; June 9th, club run to Courtland; July 3rd and 4th, club run to Vallejo; July 14th, club run to Monument; August 10th and 11th, club run to Sacramento slough; September 8th and 9th, two-day run, destination to be announced later; October 5th and 6th, Robbin's cup race at Sausalito.

The Naugatuck Valley Motor Boat Club, of Shelton, Conn., at its annual election held March 26th, chose the following officers for 1912: Commodore, Chas. H. Smith; vice-commodore, Percival E. Borden; secretary, John A. Thomas; treasurer, C. J. Radcliffe; fleet captain, D. H. Murphy; harbor master, H. W. Vaughn. It was also decided at the meeting to equip the clubhouse with electric lights. Later in the evening a banquet was served, at which many interesting speeches were made and several musical selections rendered. A number of guests were present from other cities.

The Yachtsmen's Club of Philadelphia will hold its long distance race for motor boats this year on July 6th. The start will be made from one of the Philadelphia clubs on the Delaware River and the racers will go to Hampton Roads, where the crews will be entertained by the Hampton Roads Yacht Club. Returning, the boats will run to the Baltimore Yacht Club and then return to their respective clubs on the Jersey coast by way of the Delaware and Chesapeake Canal.

The Dubuque Motor Boat Club, Dubuque, Iowa, at its annual meeting, passed a resolution in favor of a limit of 200 cubic inches cylinder displacement for the 20 ft. class at the July regatta of the Mississippi Valley Power Boat Association. The resolution was sent to Commodore T. H. Lembrecht, of the Davenport Boat Club, with the request that he use his influence to establish such a limit. At the election held at the same meeting, St. Clair Ede was chosen commodore. The club accepted the invitation of the Clinton Club to stop at Clinton over night when the cruise is made to the Davenport regatta in July.

The Mississippi Valley Power Boat Association has changed the cruising race, which is one of the big events of the regatta to be held at Davenport, Ia., July 4, 5 and 6, from a 10 to a 60-mile run. The course will be to Muscatine and back, and Muscatine has offered a handsome cup for the first boat to reach that city. The Davenport Boat Club and the Commercial Club of the city are co-operating to make the regatta an occasion long to be remembered. Cash prizes amounting to $6,000 have already been offered and it is expected that the opening day of the meet will see nearly 50,000 persons gathered to witness the contests.

The Houston Launch Club, of Houston, Texas, has decided on June 24th, 25th and 26th as tentative dates for its regatta. It is thought better to hold the event earlier in the year than has been done heretofore so that it will come before the summer exodus begins.

The Western Power Boat Association is endeavoring to help along the preservation and improvement of the old Illinois and Michigan canal and Leroy Cook of the W. P. B. A. has secured a list of the motor boats, yachts and kindred craft which passed through during the season of 1911, showing conclusively that the waterway is of real use to the boating public. The list shows a total of 219 boats which passed through exclusive of perhaps 50 small power boats whose owners live in the towns along the canal and do not venture with their little craft into wider waters. The boats registered hailed from ports in Illinois, Wisconsin, Missouri, Indiana, Michigan, Iowa, Ohio, Texas, Pennsylvania and Tennessee—ten states in all, showing that the I. & M canal is of benefit not alone to those whose home port is immediately adjacent. The association regatta which will be held at Chicago some time during the month of August, is assuming large proportions even at this early date. Commodore Hale Thompson has donated a trophy to be given to the owner of the boat that shows a speed of 50 miles an hour during the races and it is confidently expected that the prize will not go begging. The Wrigley $5,000 cup will go to the winner of the 40 ft. class and Adam Weckler has offered a $1,000 trophy for the fastest boat among the 32 footers. For the smaller boats there is the $500 cup contributed by W. C. Thorne for the winner in the 26 ft. class, a $500 prize donated by Murray Keller for 20 footers, and a cup valued at $250 which Geo. B. Carpenter has offered for the boat of any class setting a new mile record. Among the boats that will probably be seen at the regatta are the Dixie IV, Red Top, Kitty Hawk, Disturber III and other well-known speed craft.

The Genesee Power Boat Association, of Rochester, N. Y., held a smoker on the 29th of March in Forester's Hall, on Main Street, for all those interested in motor boating, whether members of the association or not. At this time twenty new members were taken in, bringing the total membership up to nearly a hundred, and it is hoped to increase this number to one hundred and fifty before the close of the summer. The club plans to hold races on Decoration Day. This will be the first of a series of meets to be held at different times during the summer.

Commodore J. Stuart Blackton and President Taft. The commodore has just been regaling the President with a good story.

The New York Motor Boat Club regatta committee has started a project to have representatives from ten or twelve clubs form a committee and draw up a set of rules for an inter-club race. Each club will be permitted to enter as many boats as desired and the first five boats of each club will be counted in the scoring at the end of the race in the order in which they finish. While definite plans have not as yet been formed for the event, it is expected that the race will take place some time in June. It has been decided to hold the annual regatta of the Hudson River Yacht Racing Association at the N. Y. M. B. C. on September 2nd.

The Motor Boat Law in a Nutshell.

A Digest in Tabular Form of the Equipment Which the Law Requires Every Motor Boat to Carry.

NOTE.—Boats carrying passengers for hire must be operated by a person licensed by the local board of inspectors.

	LIGHTS.	WHISTLES AND HORNS.	LIFE PRESERVERS.	FIRE EXTINGUISHERS.
CLASS 1. (Under 26 feet.)	1. White light aft visible all around horizon. 2. Combination light forward, lower than the white light, showing green to starboard and red to port, fixed so as to throw the light from right ahead to 2 points abaft the beam on their respective sides. (Motor boats of Class 1 may carry lights as specified for Classes 2 and 3 instead of as noted above.)	1. Whistle or similar appliance capable of producing a blast of at least 2 seconds in duration.	Life preservers, life belts, buoyant cushions, ring buoys, or similar devices in sufficient number for every person on board, and placed so as to be readily accessible. In addition, life preservers or buoyant cushions capable of keeping afloat for 24 hours a weight exerting a direct downward pull of 20 pounds, are authorized on boats *not carrying passengers for hire*. No pneumatic life saving appliances, or appliances filled with granulated cork will be permitted. Planks, gratings, etc., or small boats in tow cannot be substituted for required life saving appliances. Floats of seasoned wood, not exceeding white pine in weight, and measuring at least 4 feet by 14 inches by 2 inches, may be used. Samples of substitutes for articles mentioned must be approved by the Supervising Inspector General, Steamboat Inspection Service.	Fire extinguisher capable of extinguishing gasoline fires. The following extinguishers have been approved: Alert, Babcock No. 1, Bonner, Childs, Coston, Durkee, Ever Ready, Gold Medal No. 1, Hayward, Keystone, Protector, Pyrene, Paragon, Royal, Salvage, Stempel, Safety, Success, Underwriters' No. 6. Salt, sand or the two mixed in sufficient quantities kept in a pail or similar receptacle ready for use, will serve.
CLASS 2. (26 feet or over, and less than 40 feet.)	1. White light forward, visible from right ahead to 2 points abaft the beam on each side. Lens to be not less than 19 square inches. 2. White light aft, visible all around the horizon. 3. Green light on starboard side, red light on port side, each to be so fixed as to throw the light from right ahead to 2 points abaft the beam on their respective sides. Lens to be not less than 16 square inches. Lights must be fitted with inboard screens to prevent their being seen across the bow; screens to be not less than 18 inches long. 4. Lenses must be of fresnel or fluted glass.	1. Same as Class 1. 2. Fog horn. 3. Bell.	Same as Class 1.	Same as Class 1.
CLASS 3. (40 feet or over, and not more than 65 feet.)	1. Same as Class 2, except that lense must be at least 31 square inches. 2. Same as Class 2. 3. Same as Class 2, except that lenses must be at least 25 square inches and screens at least 24 inches long. 4. Same as Class 2.	1. Same as Class 1. 2. Same as Class 2. 3. Same as Class 2, except that bell must measure at least 8 inches across the mouth.	Same as Class 1.	Same as Class 1.
General Regulations.	Motor boats, when at anchor, must carry a white light forward, less than 20 feet above the hull, visible all around the horizon for at least 1 mile. Motor boats proceeding for any reason under sail should extinguish white lights and show colored lights only.	A mouth whistle capable of producing a sound of at least 2 seconds' duration, which can be heard for at least half a mile, is held to comply with the law.		

In addition to the above, all motor boats are required to have on board two copies of the pilot rules, which can be obtained from the local inspectors of steam vessels.

Tide Table for May.

NOTE: This table was compiled for the Port of New York. To find the time of high or low water at other points, add or subtract the increment given in the table:

DAY OF MO.	WEEK	HIGH WATER. A.M.	HIGH WATER. P.M.	LOW WATER. A.M.	LOW WATER. P.M.
1	Wed.	8:05	8:17	2:07	2:16
2	Thu.	8:47	8:55	2:51	2:54
3	Fri.	9:27	9:33	3:55	3:33
4	Sat.	10:05	10:12	4:17	4:10
5	Sun.	10:42	10:48	5:02	4:48
6	Mon.	11:20	11:28	5:27	5:28
7	Tu.	.....	12:02	6:35	6:17
8	Wed.	12:12	12:54	7:26	7:18
9	Thu.	1:00	1:58	8:17	8:28
10	Fri.	2:00	2:58	9:07	9:33
11	Sat.	3:00	3:51	9:55	10:28
12	Sun.	3:57	4:38	10:38	11:18
13	Mon.	4:47	5:23	11:20	.....
14	Tu.	5:35	6:08	12:02	12:02*
15	Wed.	6:21	6:51	12:50	12:43
16	Thu.	7:07	7:35	1:32	1:25
17	Fri.	7:52	8:20	2:17	2:09
18	Sat.	8:40	9:06	3:03	2:53
19	Sun.	9:30	9:55	3:51	3:41
20	Mon.	10:24	10:46	4:43	4:34
21	Tu.	11:23	11:44	5:39	5:40
22	Wed.	.....	12:35	6:39	6:54
23	Thu.	12:47	1:50	7:43	8:12
24	Fri.	2:00	3:00	8:46	9:25
25	Sat.	3:15	4:02	9:48	10:31
26	Sun.	4:22	4:57	10:42	11:28
27	Mon.	5:22	5:45	11:35	.....
28	Tu.	6:15	6:30	12:20	12:22
29	Wed.	7:05	7:12	1:07	1:07
30	Thu.	7:50	7:52	1:52	1:50
31	Fri.	8:31	8:32	2:35	2:30

To find the approximate time of high and low water mark at any of the following points add (+) or subtract (—) the following times from the time of high or low water at New York:

Halifax	—0:06	Yonkers	+0:56
Portland	+2:35	West Point	+3:39
Boston	+3:02	Albany	+9:54
Portsmouth	+2:56	Sandy Hook	—0:40
Gloucester	+2:57	Philadelphia	—0:36
Newport	—1:07	Cape May	—0:11
Block Island	—1:17	Baltimore	—1:28
New London	+1:05	Washington	+0:05
Hartford	+8:43	Old Pt. Comfort	+0:28
New Haven	+2:58	Savannah	—1:28
Bridgeport	+2:52	Key West	+0:11
Willet's Pt.	+3:02	Galveston	+2:44

Gasoline "puts one over" on Boreas.

New Things for Motor Boatmen

The W. C. Compass.

A compass has been designed by the Wilcox Crittenden Company, Inc., Middletown, Conn., which is built to maintain its accuracy for an indefinite period, withstanding the jar caused by heavy seas. This compass is of the oil type and is so constructed that the dial constantly remains sufficiently steady in a seaway to indicate the course and yet responds at once to any change in direction. The bowl is non-porous cast brass, and is coated inside with a composition that will not turn yellow. A flexible diaphragm allows for a slight contraction and expansion of the oil and the card is supported by jewelled bearings upon a hardened steel pivot. In connection with this compass, the company is making also a new type of course protractor, which is a valuable accessory in the binnacle and which is being sent to motor-boat owners free of charge.

* * *

Jewel Rowboat Motor.

The motor shown in the accompanying illustration is of the detachable type and operates by electricity. It is made by the Jewel Electric Company, manufacturers of the Jewel storage battery, 1122 South Michigan Avenue, Chicago, Ill. This motor can be attached to any row-boat or canoe and weighs but 30 pounds. It is operated by two storage batteries, weighing 20 pounds each, and it is necessary only to clamp the motor to the stern of the boat, and start it by turning the rotary switch at the top of the steering wheel to one of the three speeds. The motor is of ¾ h.p. and runs at 2,000 r.p.m. To steer the boat or reverse it, the motor may be turned around in a complete arc. The price of the complete outfit with two batteries, is $100, or $65 without the batteries.

* * *

A New K-W Switch.

An improved type of kick-switch, as illustrated upon this page, is being made by the K-W Ignition Company, Cleveland, Ohio, and is being furnished on K-W dash coils and master vibrators. This switch is a handsome type 4 inches high and 3⅛ inches wide, having the plate or cover finished in matted brass. The lever cannot be turned unless the plug is inserted at the side, and the switch is regularly arranged for two sets of batteries, or else for a low-tension magneto and one set of batteries. It can be adapted very easily, however, for a high-tension magneto on one side and batteries and coil on the other without extra cost if so desired.

* * *

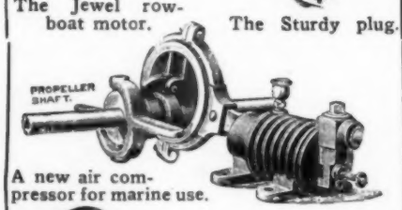
Rie Nie Enamel.

The Rie Nie Manufacturing Company, 421 Washington Avenue, North, Minneapolis, Minn., have produced a hard rubber, air-drying black enamel for brass lamps, rails and boat fixtures in general, which can be applied in the open air, giving exactly the same results as can be obtained from the baked enamel. This product dries in from six to ten hours, to a bone hardness and leaves a beautiful black finish either in gloss or semi-gloss. This product will withstand a great amount of heat and will not scratch or peal off, as is the case with some enamels. The company also manufacture a mohair top dressing, which will refinish and waterproof the material without stiffening it. This is applied with a soft brush and dries in six hours, leaving a silk mohair effect. An enamel dressing for leather and Pantasote is also made, which is designed to penetrate the material and make it waterproof, as well as bring back the original black leather effect.

The Wilcox Crittenden marine compass.

The Jewel rowboat motor.

The Sturdy plug.



A new air compressor for marine use.

The new K-W switch. A new Mazda lamp.

The Aero-Phone in use in an aeroplane.

Sturdy Spark Plug.

The plug shown in the accompanying illustration has a patented double porcelain, which protects the main porcelain from breaking through heat or vibration and which permits the main porcelain to be suspended against the shoulder in the bushing instead of being clamped in place. This construction allows maximum expansion and contraction and to a large extent prevents breakage. The plug is readily accessible, as it is not necessary to remove the dome when cleaning. The plug is made in the three standard sizes at a cost of $1, although one extra plug is sent with each set of four or six. It is made by the Sturdy Manufacturing Company, 631 Michigan Avenue, Chicago, Ill.

* * *

A New Mazda Lamp.

The Federal Miniature Lamp Works of the General Electric Company, of Cleveland, Ohio, have overcome the difficulty due to breakage from vibration of the regular Tungsten filament lamps and are now making miniature bulbs with a drawn-wire filament, which is much stronger and which does not in any way sacrifice the economy in current consumption. As is known by those who have had experience with electric lighting, the first practical results obtained in the earlier construction of lamps of this type were a marked increase in efficiency, together with a marked decrease in current consumption, although the one problem had been to manufacture a lamp that would withstand the results of vibration. The lamps now made are designed particularly for the strenuous service required of motor boat lighting and are highly finished.

* * *

A New Air Compressor.

The Sixth City Safety Manufacturing Company, P. O. Box 422, Cleveland, Ohio., has just brought out an air compressor of the clutch type, which is extremely useful for the small motor-boat, inasmuch as it eliminates belts or intricate gears. The simplicity of this compressor may be seen from the illustration. It is operated by simply throwing in or out the clutch with a very slight effort, and when the pressure in the tank is sufficiently high, the clutch may be thrown out so that the shaft will remain idle, affecting the motor in no way. The clutch is operated by the small lever shown, and, since the mechanism is very simple, there is nothing to get out of order or to give trouble in any way.

* * *

The Aero-Phone.

This device consists of two watch-case receivers made especially for use as mounted in the ear flaps of the regular type of helmet used by racing pilots or aviators and connected with these receivers is a light-weight transmitter made so as to operate in unison with the remainder of the apparatus. This transmitter is held in place by a band of soft leather and a flexible cord with a plug at its end serves to connect this with the remainder of the apparatus, which consists of a few small batteries and the voice magnifying device. The purpose of this is to enable operators of racing boats or aeroplanes to hold conversation with each other without being obliged to change their position or distract their attention from their duties. Two extra binding posts are provided which may be connected with either a wireless telephone or telegraph apparatus. The device is made by the Bernays Johnson Wireless Telephone Manufacturing & Holding Company, San Antonio, Texas.

A New Marine Compass.

The compass and binnacle shown in the accompanying illustration is one of the latest products of the E. J. Willis Company, 85 Chambers Street, New York City, and is said to be particularly suitable as a prize for motor-boat races. The compass is of the liquid type, guaranteed accurate, and the binnacle is a polished brass receptacle designed to fit this compass closely, leaving just enough space for it to swing freely with every motion of the boat. The cover is detachable and the case is fitted with a flange so that it may be fitted over a bracket attached to the bulkhead. The compass carried is two inches in diameter and the extreme sizes of the binnacle is 3½ inches in diameter and 3 inches in height. The price of this compass is $7.50.

* * *

A Mattress for the Mariner.

A mattress designed to be rolled up and carried in a small place, and which will be found very useful either on camping trips or upon cruises in a small craft, is known as the "White Swan" camp mattress, and is manufactured by the Tom B. Burnett Company, Dallas, Texas. The cover of this mattress is made of waterproof material, so that it can be laid on the ground if necessary without absorbing any moisture. Straps are attached to the bottom so that the mattress can be rolled up into a compact water-tight bundle, which may be stowed in a locker. It weighs from 16 to 25 pounds, according to the size. All mattresses are 6 feet 6 inches long, and the various widths cost from $22 for the 2-foot width, to $25 for the 3-foot 6-inch width. Odd lengths or widths may be procured if desired.

* * *

The Sexton Can.

The galvanized gasoline measure shown in the accompanying illustration is the product of the Sexton Can Company, Hartford and Wendell Streets, Boston, Mass., and is particularly useful to carry a supply of gasoline from the boat house. A similar measure is made of very heavy tin for large boat houses, but the one shown is adapted particularly for the small boat owner. The can holds five full gallons and has a sufficiently large spout and filler opening to allow the gasoline to be poured from it very rapidly. The filler opening is covered by a large cap and is fastened to the side of the can by a chain, so that there may be do danger of its being lost or mislaid. It is thoroughly tight, so that the gasoline will not evaporate or leak and the handle of the can is so balanced that the liquid may be poured from it with the greatest ease.

* * *

A New Reamer.

Chadwick & Brefetem, 34 Bow Street, Portsmouth, N. H., have brought out a new reamer, which has an unusual range of adjustment and which will be found very useful about the boat house for reaming out holes of various sizes. The cutters are made from high grade steel, carefully tempered, and are interchangeable. Extra cutters can be furnished at a reasonable price. This device is particularly useful in making fits where the holes are a trifle small, and no facilities are at hand for making them larger. The body of the tool has five grooves filled with cutters and a screw thread is on the body of the tool, a portion of it being left in the center to prevent springing. The cutters are beveled at each end, and are confined in their places by nuts, so that it is only necessary to loosen them a trifle and slide the cutters up or down in the trapped grooves to expand or contract their outside diameter, thus adapting them to all kinds of work. The prices vary according to the size.

* * *

Cleveland Lamp Fittings.

The Cleveland Storage Battery Manufacturing Company, St. Louis, Mo., have devised an electric fitting which may be applied to kerosene lamps without injuring the oil-burning qualities of the lamp and without destroying its appearance in any way. The device consists of an electric attachment which may be used either in place of the oil well or by employing another fastening device it may be used in connection with the oil well so that either may be employed as desired, the oil being at hand at all times in case of emergency.

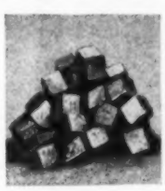
The new Willis marine compass.

The Milwaukee searchlight.

The "White Swan" camp mattress.

The Sexton gasoline can.

The Thompson feathering propeller, with blades arranged for feathering.



Metalite, exact size.

The Chadwick & Brefetem reamer.

The Morgan utility tool.

The Cleveland electric fitting for oil lamps.

A New Searchlight.

The Milwaukee Bonze Casting Company of Milwaukee, Wis., has brought out an entirely new searchlight for marine use, which is constructed of cast silver aluminum, about 3/16 of an inch thick, the interior being brought to a very high polish, similar to a mirror. This finish does not tarnish as easily as the ordinary type of silver reflector. All these searchlights are equipped with the quick-change-bulb-attachment, so that by giving the rear hub of the lamp a partial turn to the left, the hub will become loose, allowing the bulb to be removed. The bulbs are locked in place similarly by giving them a quarter turn to the right. These lights are also equipped with an exterior focusing device, so that by loosening a screw, the light can be focused so as to furnish any type of rays desired. These searchlights are furnished in 6, 8, 10 and 12-inch sizes at a price of $16, $18, $20 and $24. The cabin control searchlights made by this company are also being equipped with these same improvements.

* * *

The Thompson Feathering Propeller.

The propeller shown in the accompanying illustration is made by the Noyes Machine Company, South Portland, Me., and, although it has been upon the market for some little time, it has recently been improved in a number of particulars. It is known as the Thompson Automatic Feathering Propeller, and it is designed particularly for auxiliary craft, the blades of the propeller operating automatically and feathering edgewise with the water when the motor is at a standstill, thus practically eliminating all drag and resistance. The propeller is made of manganeze bronze and has no gears, springs or hollow shafts, as it is bored, keyed and fitted to any size of shaft in the same manner as a solid wheel. It is entirely automatic in its action, as soon as the engine is started, the blades swinging to a forward position and remaining edgewise with the direction of the motion when the engine is at a standstill, and the boat is traveling under sail power. The blades are concaved at the face, so as to give unusual propelling efficiency, and these blades automatically swing in the reverse direction when the engine is reversed, so that the concave surface operates with the same degree of efficiency. This propeller is made in all sizes from 10 inches to 10 feet in diameter.

* * *

Metalite.

Metalite is a soft combustible metallic compound in the form of small cubes, which is distributed by the Marshall Oil Company, Marshalltown, Ia., and which is used to remove carbon deposits from cylinders. All that is necessary is to place a small quantity of Metalite cubes in the cylinder to be treated, start the motor and after running it for two or three minutes, the carbon will be entirely removed. The Metalite, being very heavy, beats the carbon from the cylinder walls and with the rapid action of the motor the loosened carbon is blown out through the exhaust with the burned gases. The cubes, being combustible, are consumed and pass out through the exhaust in the form of gases. The fact that these Metalite cubes are softer than the cast iron from which the cylinders are made, eliminates any possibility of their scratching or damaging the motor in any way and the cubes are so small that they do not interfere with the seating of the valve.

* * *

Utility Tool.

A unique hand tool which can be used for an almost unlimited number of purposes has just made its appearance. It can be used as a hand vise, a fixed vise, clamp, spring compressor or stretcher, or a valve lifter, the latter use being particularly convenient in places that would otherwise be absolutely inaccessible. There are no loose parts and the lever or handle can be worked through an arc of 180 degrees, giving practically an unlimited range. It is very powerful and is strongly made from steel, with a brass nut eliminating the possibility of accidental injury, as the load is always sustained by the nut. The tool can be folded in a very compact form and the sliding jaw shown is reversible. It is made by B. Morgan, John Street, Newport, R. I.

The Kerosene Gas Producer.

The accompanying photograph shows a new type of exhaust manifold which is being used by a number of motor manufacturers in connection with the apparatus for converting motors to be used with kerosene as a fuel instead of gasoline. This apparatus is made by the Kerosene Gas Producer Company, 1926 Broadway, New York City, and with the exception of the form of the manifold, has been changed very slightly from the device as formerly used. The device is an attachment for any type of gasoline engine, whereby the less highly refined fuels may be used instead of gasoline. It is cylindrical in shape, with a diameter of about six inches and varies in length according to the horsepower of the motor, being attached in the same manner as the muffler. This producer is now being furnished to gas engine manufacturers in the form as shown, so that it will become an integral part of the engine, permitting the use of kerosene or gasoline as a fuel, at will. The engine is ordinarily started by gasoline and, after running about three minutes, the kerosene is turned on and the gasoline is turned off automatically by means of the thermostat, as shown in the illustration. The price of this producer varies according to the horsepower, the smallest one costing $40.

* * *

"Wauto" Pail.

A useful pail for the price of $1, is made by the Wauto Pail Company, 122 Fourth Street, Minneapolis, Minn. This pail is constructed of waterproof canvas without hinges, pins or other parts to come loose and the illustration shows how it may be laid out flat so as to be carried under the seat cushion or in any other convenient place in the boat. It is constructed for rough usage and is practically indestructible. A spout is provided so that water may be poured without spilling and the flat canvas strap handle makes it easy to carry.

* * *

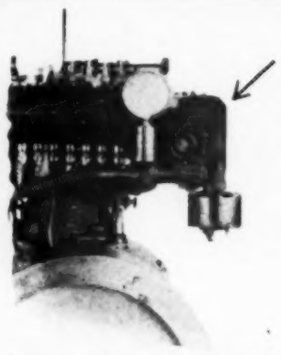
Blitz Polishing Cloth.

The Auburn Specialties Company, of Auburn, N. Y., has just brought out a polishing cloth for shining all kinds of metal, the particular feature being the fact that the cloth leaves upon the metal an invisible waterproof film, which, with a fair degree of efficiency, resists any tendency of the metal to tarnish. The cloth is impregnated with a polishing material introduced into the fabric and, as this material is non-poisonous and harmless to the hands, no injury can result from its use. Gold and silver articles may be polished with this cloth, as it can in no way scratch them. The cloth will not dry out, but will remain moist and soft as long as the fiber endures, so that it remains in a high state of efficiency for a long time. The full size cloth contains 200 square inches and sells for 25¢.

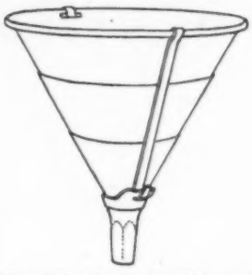
* * *

Scott Double Needle Carbureter.

This carbureter is one of the newer types, the one known as Model F, embodying a new principle, which results in unusual power and economy. Strictly speaking, however, the principle itself is not so new as the application of it to this particular instrument. The carbureter is so arranged that as the throttle is opened the air drawn in is rarefied and a partial vacuum created. As the air capacity of the venturi passage is not sufficient to overcome this partial vacuum, the external atmospheric pressure immediately forces down the auxiliary valve until there is an opening of sufficient size to neutralize the vacuum, allowing for the stress from the high speed nozzle through the ports. The quantity of gasoline drawn in is regulated by a needle valve, which is tapered on three sides to provide three fine sprays instead of possessing the usual conical form. The operation of this needle valve is to a large extent automatic, so that the mixture is supplied at substantially the same stress at all speeds. The carbureter is also provided with a starting valve and a special low-speed gas adjustment. This instrument is made by the Scott & Sons Company, Medford, Mass., and the prices vary from $30 to $50, according to the size and material of which the instrument is constructed.

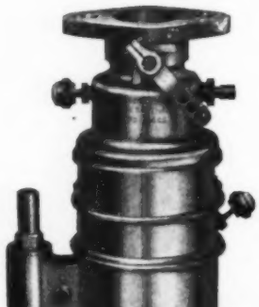


The Kerosene Gas Producer attached to a motor.

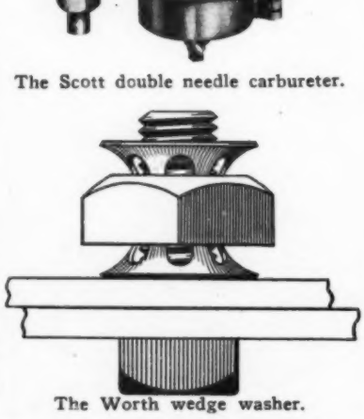


The "Best" sectional funnel.

The "Wauto" pail.



The Scott double needle carbureter.



The Worth wedge washer.

Joliet Fire Extinguisher.

This extinguisher is manufactured by the Chas. E. Wilcox Company, Joliet, Ill., and consists of powder contained in a cylindrical metal tube with a copper cap. This powder not only smothers the fire by its own action, but when thrown at the base of the flames, generates a gas heavier than the air, which settles and prevents oxygen from reaching the flames, even in the most stubborn gasoline fires. The device is intended to be suspended from the copper cap which is provided with a ring so that the extinguisher is ready for use with the one action of pulling it down and removing the cap at the same time. The powder is of a substance that will not cake or harden and it can be replenished very easily when the contents are exhausted. The price is $1.

* * *

A New Sectional Funnel.

R. L. Best, Bismarck, N. D., has brought out a funnel which takes up so small a space when mounted that it can be placed in the tool locker, occupying only 7¾ x 2½ inches. The funnel is made in sections of 26-gauge steel, nickel-plated, and when put away the sections can be nested in the box. The box in which the funnel is kept is also large enough to hold the chamois strainer, and two locking arms are provided to make the funnel rigid when in use. When the sections are nested these arms are bolted underneath. The cost of this device is $1.50.

* * *

Henke Marine Bronze.

The marine bronze manufactured by the Henke Manufacturing Company, 135 Broadway, New York City, has been still further improved in the manner of packing it so that a fresh mixed paint is now insured absolutely regardless of age. The can is so constructed that the bronze ingredients are kept separate from the liquid until the can is opened and the particular feature of the paint lies in the fact that the second coat can be applied directly after the first, inasmuch as it dries immediately. This paint was first discovered about five years ago and has been improved until at present, it is said to be absolutely proof against barnacles and grass, so that they cannot grow on the hull as long as it is protected by this paint. The marine bronze is made in two colors, green and copper, and sells for $1.85 in quarter-gallon cans, $3.50 in half-gallon cans and $7 in gallon cans.

* * *

Worko.

This product is a carbon remover manufactured by the Worko Company, of Racine, Wis., and is one of the quickest methods of removing carbon from the cylinders. Worko is a chemically treated composition, which is placed in all the cylinders at the same time by removing the spark plugs and operates by disintegrating the carbon so that it forms a fine powder. This carbon remover should be dropped into the motor, using one roll for each cylinder, when the motor is hot and replacing the spark plug. The muffler cut-out should then be opened and the motor should be allowed to race for a few seconds when the carbon will be blown out through the exhaust being acted upon by the gas generated by the remover. A package of 40 rolls, which will clean 40 cylinders, costs $1.50, and a package of 24 costs $1.

* * *

Worth Wedge Washer.

This wedge washer is made by the Steel Specialties Company, 6 Beacon Street, Boston, Mass., and is a new product, which will be found very useful about the motor boat. It forms a positive nut safeguard, as the washer is very quickly applied, and when screwed against the nut, it is impossible to jar it off, although if necessary to remove the nut, the washer can be turned off very readily or it can be cut off with a chisel. The washer is made on a scientific principle, and can be used and can be put on anywhere, without spoiling the threads. These washers are very cheap, as they are sold by weight or by the thousand, and can be supplied in any thickness of steel to fit any bolt or thread.

THE PRIZE CONTEST IN QUESTIONS AND ANSWERS

WATER in the bilge is bad enough, and there is no use in adding to your troubles by allowing rain water or spray to trickle through the hatch covering your engine. Besides this, you may short-circuit your spark plugs, and you may ruin your wiring, to say nothing of your batteries or coil if they are in an exposed position. When going into a head sea have you ever heard the water dripping through to your engine compartment? Engine hatches are almost a necessity in the modern runabout, but it is better to get along without them unless you can keep the water out. There is a way of making these hatches water-tight; in fact, there are several ways, as a study of the answers to the first question will show.

STORMS are an uncertain quantity and it is well to know exactly what to do when you are in open water and see ominous weather approaching. The general opinion seems to be that storm oil helps. One man thinks it doesn't. Perhaps you may yourself be set in your views on this subject, but we venture to say that a new light will be thrown upon it by reading the answers to the third question. At least you can learn when to apply the oil, how to apply it, and what kind to use. The knowledge contained in these answers may save you an unpleasant half-hour some day.

THE QUESTIONS FOR THE JULY CONTEST ARE THESE:

Give instructions, with drawings, for the construction of a removable cook box, by which meals can be prepared and served on an open boat or cruiser which is not equipped with a regular galley. Provision should be made for protection from the wind, stowage of utensils, etc.

Suggested by Bradford Burnham, New York City.

Give instructions and sketches, if necessary, for the construction of a simple but practical mooring outfit.

Suggested by E. A. Crawford, Newark, N. J.

Discuss mufflers vs. under-water exhaust systems, considering silence, back pressure and general efficiency.

Suggested by F. M. Royce, Pen Yan, N. Y.

ANSWERS to these questions, addressed to the Editor of MoToR BoatinG, 381 Fourth Ave., New York, must be: (*a*) In our hands on or before May 25, (*b*) not over 500 words long, (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of May.

THE PRIZES ARE:

For each of the best answers to the questions above, *any* article advertised in MoToR BoatinG, of which the advertised price does not exceed $25, or a credit of $25 on *any article* advertised in MoToR BoatinG, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.*)

For each of the questions selected for use in the next contest, *any article* advertised in MoToR BoatinG, of which the advertised price does not exceed $5, or a credit of $5 on *any article* advertised in MoToR BoatinG, which sells for more than that amount.

For all non-prize-winning answers published we will pay space rates.

When You Send in Your Answers, state what you will take if you win a prize.

Making a Water-Tight Hatch.

A Few Suggestions for Increasing the Life and Preserving the Efficiency of Your Motor by Keeping the Water Out.

THE PRIZE CONTEST—Answers to the First Question in the March Issue.

Allows Easy Access to Engine.

Prize Won: An Engine.

THERE is a watertight hatch which is suitable for most any runabout up to 36 feet in length. The drawings show it applied to a 20 ft. x 4½ ft. boat. When the hatch is back in position and the "dash" fastened down with sash locks, all is watertight and in appearance no different than the ordinary boat.

The upper half of the dash is hinged to the hatch and can be raised up and used as a windshield, or folded down on the hatch exposing the engine to view, or for minor adjustments. When the hatch is pushed forward the engine is more accessible than in the ordinary way. By removing the lock the hatch can be removed, lightening the boat for racing purposes with little to show that it ever was anything but an open boat.

The lower half of the dash stiffens the boat cross-wise, and carrying the coaming to the forward end of the hatch stiffens it laterally. The sheet rubber strips make it watertight and noiseless and are easily renewed.

The deck beams are sawed from seven-eighths material and the decking same as used on remainder of the boat, preferably batten seam, with the battens notched into deck beams, or the deck covered with canvas.

The sides, front and dash are made and finished to match the coaming, seats, etc. A one-half round molding around the front and edges cover the seams and give it a finished appearance. After the hatch is fitted to the coaming, the stop blocks and the lower part of dash is put in place. Care must be taken to get the stop blocks far enough aft to bring a good bearing on the rubber strips. The lower part of dash is built rigid and securely fastened to the frames of the boat as it carries the auto steerer, starting device, etc.

The sash locks that are used on the dash are the regular kind used on the meeting rails of window sash and the hinges are stock hinges bent to fit location.

M. A. WRIGHT, So. St. Paul, Minn.

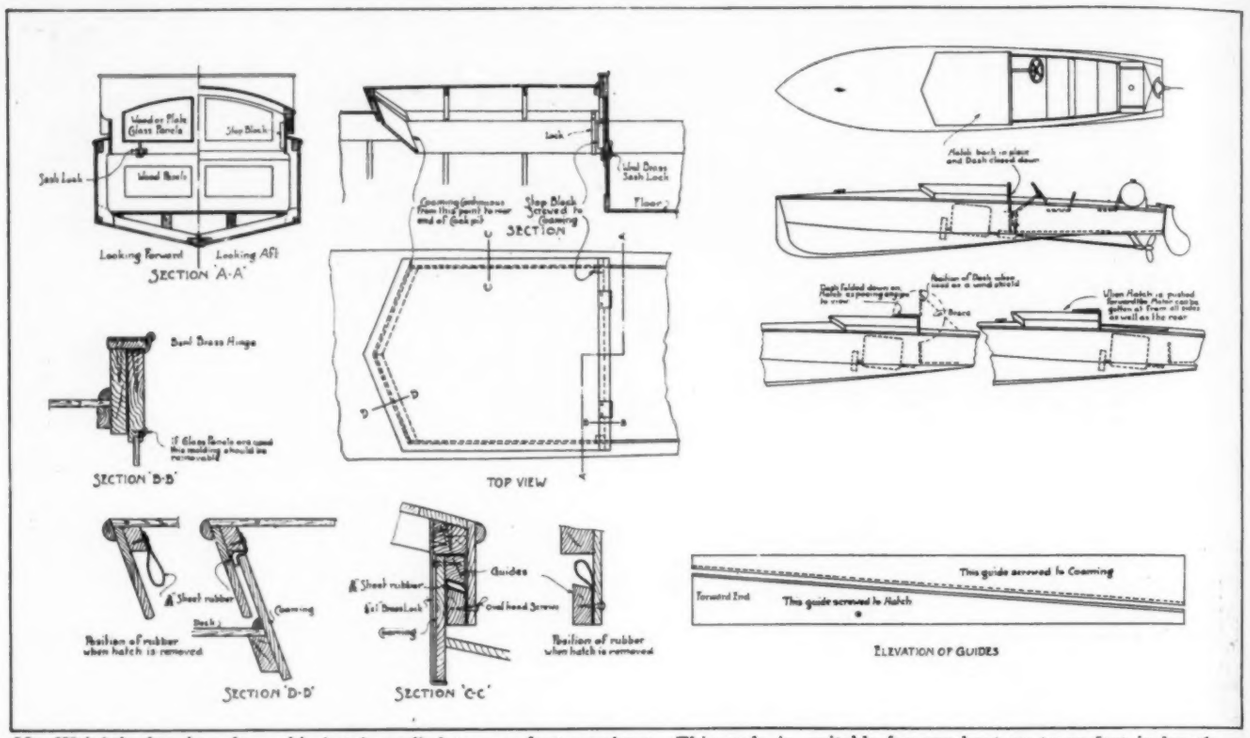
A Watertight Double Hatch.

THE accompanying sketches show a watertight hatch for the engine compartment of a runabout that I think is a neat one. The size of the hatch will determine the size of the material to be used, therefore no dimensions are given. The hatch shown has square corners, this style being the easiest to construct and fit. The hatch coaming is fastened to the deck beams in the usual way. One-fourth round of wood to match the coaming is used in the corners where deck and coaming come together. This should be set in varnish and fastened with screws. Stop waters to match coaming are fastened on the inside and allowed to project 1 inch above coaming, these being clearly shown in the sketches.

The catch-water, shown fastened to the bulkhead and beveled toward it, catches what water may go down between the covers and bulkhead and conducts this water to the deck from where it runs overboard. The construction of the covers is shown in sectional as well as inside views. The framework and beams should match the coaming, tongue and groove stock is used for covering, over which is 8-ounce canvas set in marine glue. The ½-round shown around the upper edge is put on after canvas has been laid.

The construction of the joint where the two covers come together is shown in an enlarged view. A piece of sheet rubber is bent or folded double and tacked to the edge of one of the covers, a loop being allowed to form at the top edge. A piece of sheet brass is screw-fastened to the top of the cover slightly overlapping this loop, as the hinging point of the covers is lower than the joint, the covers will press together on the rubber loop as they are closed. With the rubber edge and brass covering strip this joint can be made tight easily. The handles and the chain shown in the sketch explain themselves and will be found efficient.

This hatch is not only watertight and neat but gives a full, free hatch opening which experience has taught is of as much importance. This feature cannot be obtained where covers hinge in the center of the boat and occupy the



Mr. Wright's drawing shows his hatch applied to a 20-foot runabout. This style is suitable for any boat up to 30 feet in length.

space needed in working around the engine. This hatch could be made with one cover extending clear across hatch opening, but in most cases it will be found objectionable, being too heavy to handle easily and also heels the boat over when open. With two covers, as shown, they are easy to handle and also balance the boat when open.

GEO. SORENSEN, Rockford, Ill.

Uses Ordinary Weather Strips.

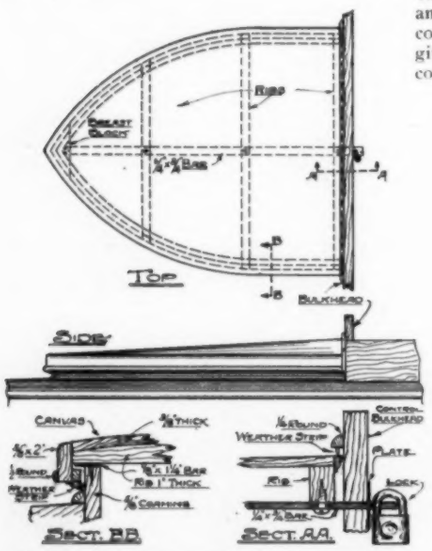
THE hatch arrangement as applied to a 23-foot auto boat is shown herewith. Illustration is not to scale but it will convey the idea, which is applicable also to other shapes. Its claim for being waterproof lies in the use of the common weatherstrip oak with rubber insert so fastened that it will touch the hatch coaming when locked. This locking arrangement is another feature and will be explained later.

To the top of the hatch coaming is screwed with flat-head screws a ⅛ x 1¼-inch metal strip, flush inside, but projecting beyond the outside of the coaming, as shown in Sect. BB. The hatch fits around this with about ¼-inch clearance. Strips are then fastened inside of the hatch and then the weatherstrip, so that it is impossible to lift the hatch off vertically; it can only be removed by sliding forward till released.

A stiffener and locking metal strip ¼ x ¾ inch running fore and aft is screwed to each rib and extends through the bulkhead (and a brass plate for finish). This extension has a hole so located that when a padlock is put into it, the rubber of the weatherstrips press up against the coaming.

In this particular boat a collapsible top covers the cockpit and the hatch cannot be moved till the top is raised and the lock unlocked. The hatch frame is of oak, covering boards ⅛-inch, white pine canvas-covered with a half-round finishing strip. Crown is the same as the deck, and was painted the same color. A ventilator was also put in the middle of it and the hatch is entirely waterproof if fitted correctly. The drawings which appear below give a good working idea of how the hatch is constructed.

L. R. KELLEY. Philadelphia, Pa.



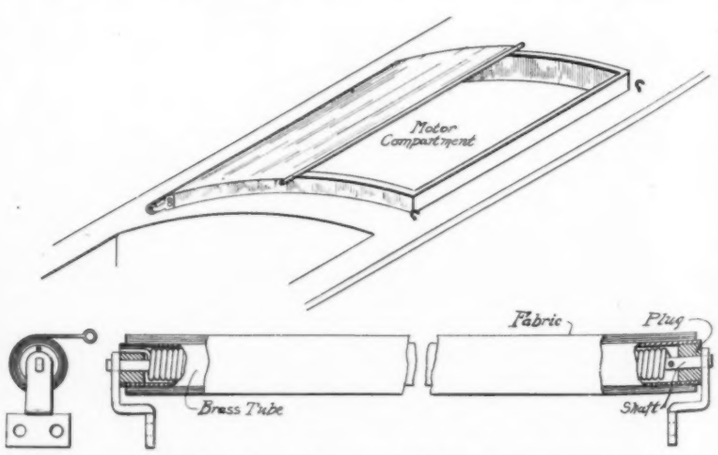
Mr. Kelley recommends ordinary weather strips to keep the water out.

A Roller Curtain Cover.

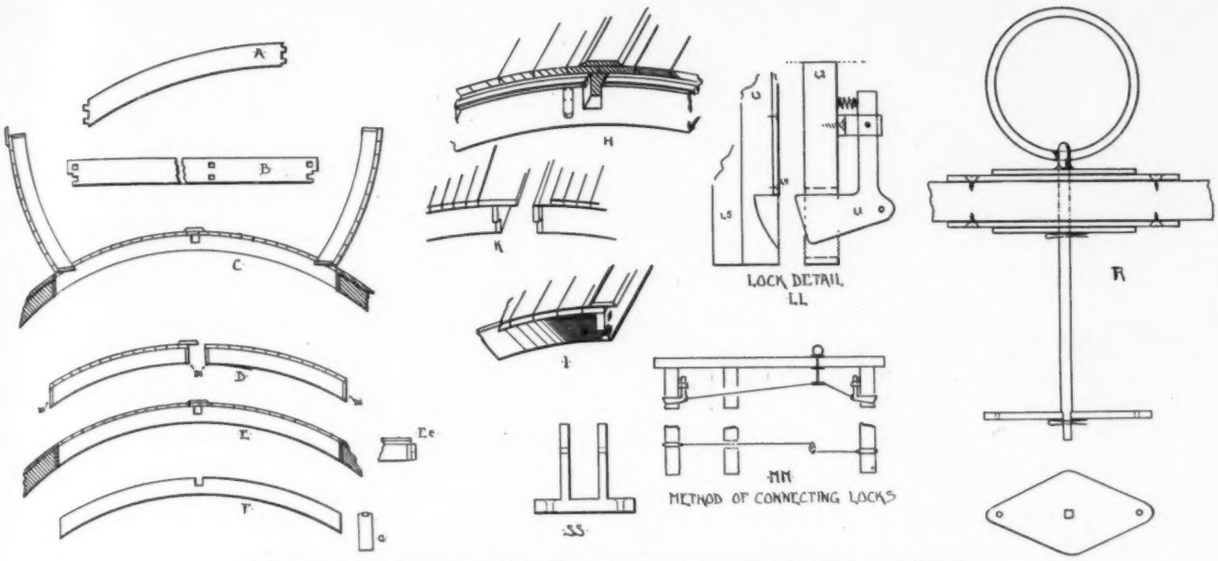
THE drawings illustrate a hatch constructed on the principle of the roller curtain. The roll itself is made of 1¼-inch brass pipe or tubing. Brass plugs are inserted in each end and secured by small screws. These plugs are first drilled to receive the shaft, which may be of ⅜-inch brass rod. One end of the spring is secured to the shaft and the opposite end to the plug as shown. The supporting brackets may be made of ¼-inch sheet brass, slotted to receive the shaft and keep it from turning.

The auto top material which forms the fabric is riveted to the pipe before the end plugs are inserted, care being taken to drill the rivet holes through both sides to facilitate the insertion of the rivets. The fabric should be wide enough to project at least ½-inch over the edges of the compartment. The loose end of the fabric is bound over a brass rod long enough to enable the ends to be retained by the hooks when it is desired to close the compartment. If it is a comparatively long compartment, it will be necessary to provide one or two light supports of the same curvature as the ends, to prevent the material from sagging.

J. F. C., Providence, R. I.



A hatch constructed on the roller curtain principle is suggested by J. F. C.



Details of construction of the self-locking hatch described by Melvin Andrews.

An Engine Hatch with a Self-Locking Device.

ONE of the requirements for a hatch is neatness, and this doesn't mean the use of a lot of cleats, brass strips to cover cracks, and the usual amount of junk showing on the surface of many motor boats. This is emphatically not the day of gaudy decorations, the tendency being to get everything out of sight. The plainer the article on the surface, the better it is liked.

Referring to the drawing. The section marked "A" is the hatch beam. This is half of the regular deck beam that has been cut away to make the hatchway, four extra beams are required, two for the beams "F" and two, which when cut in two, will make four beams like "A." The center hatch cover beams are spaced the same as the regular deck beams they supplant.

The part "B" is of the same material as the part "A," and is as long as the hatchway opening, the mortises cut in each end of "B" are the thickness of "F" from each end; that is, if "F" is ⅞ of an inch thick, the mortises will be cut ⅞ of an inch from the end of the stick. The mortises in the middle of the stick are spaced as the deck beams. Of the stick "B," two pieces are cut; these are the parts "D1" in the Figure "D." The parts "D2" are shorter at each end by the thickness of "F" than "D1." This makes the mortises at the ends mere notches; otherwise they are similar to "B" or "D1."

Fig. "D" is an end view of each cover.

Fig. "E" is a sectional view of the hatchway, showing the part "F" in place against the regular deck beam.

Fig. "F" is one of the extra beams, and is of the same curve as the deck beam it is fastened to. The notch in the center of each piece is twice the width of the piece "B." This notch takes the end of each piece marked "D1" or "B." The ends of the pieces "D," or "B" are about half the total width of the piece. The notch in "F" is, therefore, of a depth to equal the end of "B."

Fig. "G" shows an end view of the pieces F. The small square in the top of the drawing represents the end of a strip of rubber. A narrow flat rubber belt makes as good a watertight joint as any fabric that would likely be used. It has all the body necessary for long life and yet is resilient enough to follow any irregularity of the cover and make a practically watertight joint.

A strip of this rubber tacked against the side of "D2," where it faces the side of the hatchway, will make this joint tight enough to keep out all but a few stray drops.

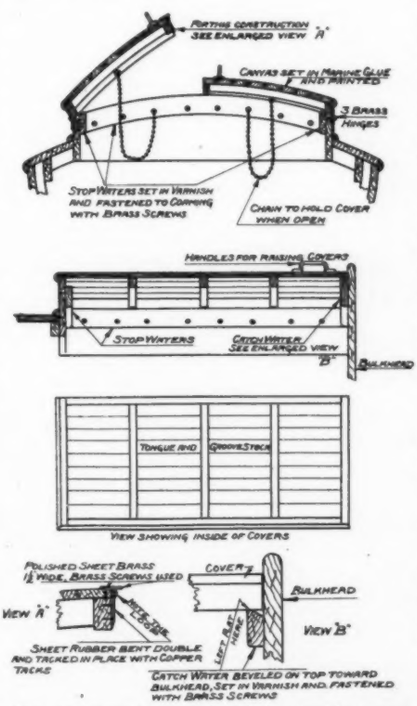
Fig. "H" is an end view of the deck where it joins the hatchway, showing the beam "F" fastened to the regular beam, with a piece of brass or iron sunk in the surface to correspond with the spring lock in the hatch cover, which is described in "LL" and "MM." The cover plank is shown in this drawing although some decks are made with a flush key plank.

While the key plank construction is neater than any batten or cover plank, it is also much harder to fit than the others, so it is not as generally used.

Fig. "K" shows the method of making a water-tight flush joint with a key plank.

Fig. "I" shows the end of the cover with the cover board in place.

Fig. "LL," which, although it isn't a waterproofing device, will help in its own little way to keep out water as well as other intruders. Even the most water-tight hatches if not fastened will, with the continual pounding of the engine, wear loose and let the water leak in on the engine.


FOR THIS CONSTRUCTION SEE ENLARGED VIEW "A"
CANVAS SET IN MARINE GLUE AND PAINTED
3 BRASS HINGES
STOP WATERS SET IN VARNISH AND FASTENED TO COAMING WITH BRASS SCREWS
CHAIN TO HOLD COVER WHEN OPEN
HANDLES FOR RAISING COVERS
STOP WATERS
CATCH WATER SEE ENLARGED VIEW "B"
BULKHEAD
TONGUE AND GROOVE STOCK
VIEW SHOWING INSIDE OF COVERS
POLISHED SHEET BRASS ½ WIDE, BRASS SCREWS USED
COVER
BULKHEAD
VIEW "A"
WATER TIGHT JOINT
VIEW "B"
SHEET RUBBER BENT DOUBLE AND TACKED IN PLACE WITH COPPER TACKS
CATCH WATER BEVELED ON TOP TOWARD BULKHEAD, SET IN VARNISH AND FASTENED WITH BRASS SCREWS

Mr. Sorensen's hatch is of the double type. Note the stop-waters set in varnish.

Fig. "L1" is a piece of brass or iron, four inches over all in length, and three inches in width. It may be cast or else cut from heavy sheet metal. Casting is the best plan, as the thickness can be made much greater.

Fig. "L2" is the hatch beam "A." Fig. "L3" is the hatchway beam "F." Fig. "L4" is the strip of metal spoken of in the preceding paragraph, and is used as a guide for 'L1," and to hold the lock "L1" when the cover is shut.

Fig. "L5" is the general deck beam at the end of the hatchway.

Fig. "MM" shows the method of connecting the two locks. A heavy wire is used to connect the two locks with the ring and rod. It is a pull to open the locks and almost any wire about ten or twelve gauge will do.

Fig. "SS" is an approximate view of the bearing used to hold the lock "LL."

Fig. "R" is the ring and bolt, or rod, used as a means of lifting the hatch cover and to operate the lock. It consists of an eye bolt with a ring, two large washers, one to be fastened to the deck side of the hatch cover, and the other on the under side of the planking to coincide with the upper washer. Two smaller washers are loose on the rod, but held in place by the cotter-pin "O." The end of the rod is squared and a diamond-shaped piece of metal fastened to the end by another cotter-pin.

The wires are fastened to opposite corners of this piece. To open the hatch cover, the ring is turned half way around. This pulls the lock catches away from the metal latch "L1"; the ring is then ready to pull up the hatch cover. If you do not care to have the covers lie back on the deck a small chain fastened to the covers and to the ends of the hatchway will permit the covers to swing back the length of the chains.

MELVIN D. ANDREWS, Canandaigua, N. Y.

Slides Into Engine Compartment when Removed.

A PRACTICAL and successful waterproof hatch for the engine compartment of a runabout should possess the following features: 1, simplicity; 2, rigidity. 3, permit easy access to engine and parts; 4, strong in construction and capable of sustaining hard usage; 5, permit removal with ease and occupying a minimum amount of valuable space when removed.

The accompanying drawing shows a hatch possessing all the above features and in addition it is applicable to the ordinary runabout in use at the present time and may be con-

structed at small expense by the amateur.

At A, Fig. 1, is shown the hatch cover in position for protecting the engine and at C, Fig. 1, the hatch cover is shown removed for making inspection and adjustments to the engine.

The hatch cover when housed occupies a small amount of valuable space and lies in such a position that it is protected from the wind and out of the way of the operator.

In construction the hatch cover is of the ordinary box frame type made in one section, top view being shown in Fig. 2. The athwartship dimensions of the cover is made a trifle shorter than the hatch frame for the purpose of providing sufficient clearance to permit the cover to be raised and lowered. At each end of engine compartment on bulkhead or deck frame is fastened a brass roller, shown in Fig. 6, the purpose of these being to provide a fulcrum or turning point for the hatch cover to revolve upon and permitting the hatch cover, with the aid of brass stop, shown in Fig. 1, to be brought to the same relative position at all times.

Brass ribbon is fastened to under side of hatch frame at each end for the purpose of facilitating sliding cover with the least amount of resistance.

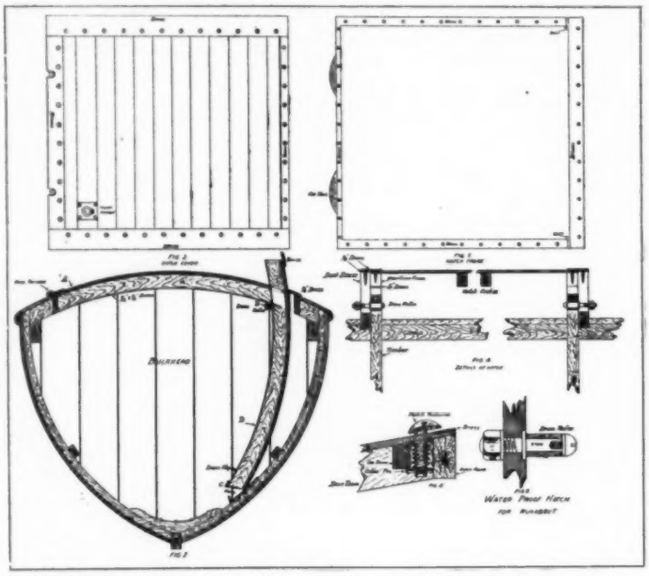
The hinge shown at C Fig. 1 provides a handy and efficient means of supporting the cover and may be turned back flush with side frames when not in use. Brass moulding should be used around the hatch frame and cover, as shown in Fig. 2 and Fig. 3. This not only makes a very substantial and mechanical job but adds to the appearance of the whole equipment.

While the hatch described above has been found to answer the requirements necessary for the weather conditions to be met with in the waters around Block Island, it may be desired by some to further safeguard against leakage due to heavy spray, by placing strips of thin felt to brass moulding of hatch frame, Fig. E, and securing it by a good quality waterproof cement, a perfectly waterproof hatch cover may be obtained and at a small additional expense.

Drawings for the construction of this hatch appear on this page, and by following them anyone used to the handling of tools should be able to build a thoroughly efficient one for his runabout. H. H. HALL, New York City.

Another Ingenious Locking Device.

THE hatch I am going to describe is fairly easy to construct, is absolutely watertight, and is appliable to boats that have either hatches flush with the deck or mounted above the deck on hatch coamings. The method can be used with a metal hatch, a wooden hatch or a canvas-covered hatch. This advantage makes it appliable to any type of boat of the runabout type or on cruising boats that have the engine installed under the cockpit floor with a hatch leading to the deck.



Mr. Hall's disappears into the engine compartment when opened.

The hatch in question is mounted above the deck, as this is the usual way that runabouts are designed, but it can just as easily be made flush with the deck by dropping the hatch coamings below the deck instead of above it.

Around the entire top of the hatch coaming runs a strip of either ¼ or ½-inch brass half-round, such as is used for stem bands on small boats, counter-sinking the screws. Be sure that the brass fits neatly around the corners of the coaming as otherwise there will be a leak there.

Now obtain a piece of rubber—the kind known as sponge is the best—about 1½ inches wide and long enough to go entirely around the hatch. Screw this to the edges of the hatch so that when the hatch is down the rubber will press against the strip of brass. If you intend to use a metal hatch, rivet the rubber to the under side of the hatch instead of using screws. The rubber should also be neatly fitted at the corners.

The strong back that supports the hatch in the center must have two half-round or V-shaped channels cut in it from one end to the other and so located that the cuts are directly under the two joints where the hatch is hinged to the king plank. Bore a hole through the forward end of the coamings into each of these cuts, and then any water that might leak through the joint between the king plank and the hatch cover proper will drain through the channels and outside the compartment through the two holes in the coamings.

One of the most serious disadvantages of the usual type of hatch cover is the difficulty of fastening down the forward ends of the cover tightly to the coamings. The cover described above does not have this disadvantage as will be now shown. Obtain four heavy pattern screw-eyes with about a half-inch opening, and screw them into the four outside corners of the hatch about four inches from the forward and after ends of the covers, and as near to the edge of the covers as you possibly can and still have the covers close. The eyes want to be put in so that the openings show fore and aft. Do not screw the eyes all the way in, but leave about three-sixteenths of an inch of the shank out so you can take up for wear. Now get four heavy pattern hooks with an eye in one end so they can be screwed to the inside of the coamings as shown. One inch from the hook end beat the shank with a hammer until you flatten it for a distance of about one inch towards the eye end. Now get two pieces of quarter-inch rod, long enough to reach from the forward back through the bulkhead and be bent in the form of an eye or handle. Fasten the forward end of this rod to the flattened part of the hook with a loose rivet, and do the same with the after hook, so that when the rod is pulled aft the hooks will raise and engage the eyes in the under side of the hatch cover. It will be necessary to bend the point of the hook so that it makes an angle of a little more than 45 degrees with the shank so that the hooks will exert a wedging action when engaged with the eyes. GERARD T. WHITE, New York City.

The Dual vs. the Double System.

Which You Should Use and Why You Should Choose It. The Question Discussed From Both Sides, with the Good and Bad Points of Each.

THE PRIZE CONTEST—Answers to the Second Question in the March Issue.

BY A double ignition system is usually meant one comprising two independent systems, while in a dual system there are two current sources, but only one set of high-tension wiring and spark plugs.

In favor of the latter system it may be argued that besides being less expensive, it is simpler than the other. On the other hand the same commutator is usually employed for both magneto and battery currents. Trouble with this will usually put the system out of commission. Also in most systems the same coil is used for both battery and magneto current. If the magneto should stop in such a position that the make-and-break device is closed and in starting the switch should be thrown to the battery side, the engine will not start, but a large volume of current will be drawn from the battery. The magneto coil primaries are usually of quite low resistence, and, as there is no vibrator to limit the amount of current passing through a set of dry cells, may have the best life taken out of them in a short time. If a storage battery is used the coil will soon heat up noticeably, which at least cannot be beneficial to it. When running on battery such a coil, being intended primarily for use with the magneto, is likely to be quite extravagant of current.

Perhaps the greatest sources of trouble with the ignition systems are the spark plugs. With a double system two set of plugs are used. Thus one set will always be in reserve. It is claimed that the set not ordinarily used may become fouled, but the best practice now locates both sets in the inlet valve pocket, where they will be kept clean. With a double system, if any breakdown should occur in the ignition apparatus while running it need not necessitate the engine's being stopped, but the other part may be used until the break is repaired unless the trouble is with the spark plugs.

J. T. L., Worcester, Mass.

Double System Most Reliable.

Prize Won: A 3A Kodak from Herbert & Huesgen.

Several Combinations Considered.

WHEN a charge of gasoline vapor has been compressed and an electric spark discharged therein, a violent "explosion" occurs, due to the rapid combustion and expansion of the gas. This combustion, however, is not completed instantaneously with the eruption of the spark, as is demonstrated by the range of crank motion, in degrees of arc, through which the spark can be advanced and discharged before compression is completed. Furthermore, the higher the compression the more rapidly is the charge consumed, but there is always a varying period of time between ignition and complete combustion, even when every factor entering into the combination is perfect.

The flame extends throughout the mass of gas from the ignition focus to the periphery in radiating lines, or expanding spheric form; therefore, if an electric spark be discharged at any one point in the compression space it naturally follows that the gas at this point will be consumed before that at a point more remote.

Now, if two or more foci be ignited at the same instant, the charge will be burned in half the time, or less, and larger caloric value generated consequently, increased pressure will be developed at the instant of highest compression, and much greater horsepower realized than would be the case under the conditions of a single spark.

But there are a few points to be considered in objection. First, the increased explosion shock would tend to add to the normal stress on the motor, resulting in greater wear and tear, and likewise unless provided for, additional lateral thrust on the piston favoring the tendency to wear the cylinders out of round. Second, the multiplication of electrical and mechanical apparatus not only adds to the difficulties of operation, but to the cost as well. It is very questionable whether the gain in power would compensate for the complications, losses and costs, except in the highest type of racing machines, where skilled men operate the power plants.

Probably the best method for the consummation of the ideal is the insertion of two spark plugs in the cylinder, wiring each plug from an independent high tension magneto, geared to the cam or crank shaft. This plan would work admirably because of the accuracy with which it could be adjusted. But when the gears begin to wear, carbon or oil deposits occur to produce shorts, or leakage from conductors interferes, then our troubles begin. For be it known that high tension currents are very wilful and hard to control, and, unless the discharges are practically simultaneous, the laggard is wasted.

Suppose the plugs are connected to two independent induction coils under the control of a single timer in the primary current circuit. Now we add the previously mentioned possibilities to the trouble of keeping the tremblers in "tune." For should the trembler contacts be other than perfect on both coils, lagging in one circuit is sure to occur and its sparks therefore useless. Introducing two timers or distributing devices at once adds mechanical complications almost too difficult to overcome.

If one is so unwise as to wire two plugs from a high tension magneto, distributor or induction coil, he will find he must have two plugs absolutely identical in every way at all times, for even the slightest defect, carbon deposit, or what not, will cause the current to dodge through the path of least resistance and only one spark will result, or while both may discharge one will be so weak as to be practically useless.

Now let us consider for a moment the possible value of a high tension jump-spark in conjunction with a low tension make-and-break device, or even two of the latter in one cylinder. By the very nature of these they must result in failure because of the uncertainty of the mechanical parts. Wearing of the bearing surfaces, weakening of the springs, burning away of the contact points, and other things too numerous to mention, would make the simultaneous action of these sparking devices practically impossible. You will understand I am considering machines in use in the hands of the average operator and not the brand new directly from the hands of experts. Besides, how is the average man to know he is being benefited, that his plant is operating correctly, unless he is continuously counting r.p.m.'s or has some form of recording device. External spark gaps are of little use for the human eye cannot detect the slight difference in the rate of spark speed. The only advantage I can see, cost not considered, is a double source of spark inside the cylinder at all times to guard against breakdown from this source. With this idea in view my choice would be a combination of make-and-break with high tension jump-spark.

L. H. PRINCE, Philadelphia, Pa.

Advocates "Dual" System

THESE terms are in a great majority of cases erroneously used. Both systems make use of chemical and mechanical sources of current. In the dual one wire plant is used in common. In the double two complete and separate plants are necessary.

The dual has the ordinary battery and low tension magneto, using the common timing gear in order to use the single set of secondaries and plugs. The coil is provided with a special vibrator used only in starting. If there is a compressed charge in either of the cylinders the motor will start without cranking when this vibrator is brought into use.

In the double system the mechanical source is generally a high tension synchronous magneto, having secondaries leading direct to the magneto plugs. The battery side uses the common ordinary every-day ignition coil, timer, secondary, plugs.

In the dual there is the usual chance of trouble; in the double this is no doubt eliminated since there are two wire plants. Keep either system in shape and it is as good as the other. Personally the extra wiring needed for the double would preclude its use, better one set in shape than two in half shape. The knowledge that there is an extra system to fall back on breeds a bad case of false security, generally.

Further, 75 per cent. of the marine motors are designed for one spark plug hole and the extra hole necessary for the double is practically impossible to construct.

C. PETERSON, Brooklyn, N. Y.

The Why and How of Storm Oil.

A Discussion of the Uses of Oil on Troubled Waters, with Some Suggestions as to the Method of Employing It to the Best Advantage.

THE PRIZE CONTEST—Answers to the Third Question in the March Issue.

THE use of oil to form a slick and modify the sea dates back far beyond the memory of our oldest navigators, although among seamen a tradition exists that its use was first suggested during the time of those great navigators, the Phoenicians, many years B. C., from observing that after passing through the wake of whales, the oil exuding from their bodies left a perfectly calm spot there, and that this gradually spread until it was entirely disseminated. That this is the case can easily be certified to by any sailor who has been in the vicinity of these mammals.

While it is true that now and then one may hear its usefulness being criticised by some, seafarers' experience has proven beyond all doubt of its quick action in smoothing a breaking sea, and those questioning the action of oil on water may easily satisfy themselves by trying this simple experiment, at some leisure moment, and note the results. When anchoring in some exposed place where there is a seaway running soak a large handful of waste in oil and fasten to the anchor or anchor cable with a small piece of marline in such a way that the waste will float several fathoms ahead of the boat, and as soon as the oil has had a chance to spread your cruiser will be anchored in unbroken waters, since as soon as the oil spreads on the surface of the water it places a film over it which effectually prevents the waves from coaming and breaking. Of course, it has no effect on the swell.

Three bags should be sufficient for a boat and they may be constructed in any manner desired, although the usual shape is cylindrical and about six inches in diameter, of two or more thicknesses of heavy canvas. Stuff with oakum and punch full of holes at least a quarter of an inch in diameter to allow the oil to leak out, which is easily done with a marline spike. These holes also admit the water, so it can facilitate the oil leakage and make it more uniform. Saturate the oakum with lard oil if obtainable, as experiments tend to favor it to all others; still most any oil will serve in an emergency, although mineral oil, having little fatty matter, will not produce as good result as a vegetable oil, while lard oil being composed entirely of fat is the most effective. In cold weather the bags are not as efficient as in warm, owing to the fact that the oil thickens and does not spread as readily. In using them it will be well to remember that they must float to prove beneficial, and to be assured of this it is good policy to lash them to a piece of wood before paying out to keep them close to the surface.

If riding to a sea anchor bend them to the cable so they will be several fathoms ahead of the boat. Running before the wind tow one from each bow, using enough line on them so they will always be in the water. At anchor make one fast to the cable several lengths ahead of the boat, allowing sufficient line so it will float freely, and in an unusual stress of weather either at anchor or riding to a drag it may be necessary to use one ahead, one amidships, and one on the quarter to produce the desired effects. When not in use they may be stowed away in a bucket or tin can so they will not soil the boat.

E. A. CRAWFORD, Newark, N. J.

Recommends Lard Oil.

Prize Won: Whistle Outfit from E. J. Willis Co.

Does Not Advise Using Oil.

"STORM" oil is more a tradition of the merchant marine than a dependable agent for smoothing crests of seas if statements of a number of seasoned mariners are worth anything to the motorboat fraternity. I asked one of these old seafarers how he would use oil from a 30-foot cruiser in case he happened to get caught in a bad chance, and he laughed at the very idea of saving property and lives by such means.

"You couldn't carry enough oil to be of any use in a boat that size," he said. "If you had the oil there wouldn't be room for anything else aboard. Like's not the man in the motorboat wouldn't have had enough experience to use oil properly, anyhow. Oil must be mixed with gray matter or it won't knock the kick off a hisser.

"Suppose your motorboat is caught in a heavy gale," he went on, "and she was in a bad way. The best thing to do is to forget the oil and let her drift with helm hard up. She probably will turn tail to the sea and roll heavily in the trough. If her weights are low she won't roll over though her motion may smash things below deck.

"One big sea generally does the damage in hurricanes, a sea big as a mountain that may not have another anywhere as large in 24 hours. Oil might smooth that particular sea enough to enable a boat to live provided you hadn't wasted all your oil before it happened along. Fish oil is what vessels of the merchant marine most always use in bad weather. If the water is cold the oil is thinned with kerosene so it will spread on the surface and not curdle. In warm latitudes almost any kind of oil will answer, but fish oil appears to have the preference the world over.

"Why do I use oil when I have admitted that I don't place much faith in its efficacy? That's easy to explain. Custom has prescribed certain measures that commanders shall apply under certain conditions. Custom old as Father Time says oil will smooth breaking crests. Very well. I use oil according to prescribed rules because I have valuable lives and cargoes in charge. Suppose my vessel should be lost and the investigation to determine causes contributing to the disaster disclosed that I didn't use oil? I'd be censured, probably lose my certificate and have a deuce of a wait before getting another command.

"A craft generally oils the sea when she's hove to by means of bags filled with oakum, over which oil has been poured till you can squeeze it out readily. A common burlap potato bag is best because it permits the oil to drip readily. The bags are made fast to the catheads or stuffed into the forward waterclosets. Then, as the ship sags off the slick spreads out ahead. In running before a gale the oil may be dropped from the quarters.

"But I have had vessels boarded by great seas when oil was used and the surface of the water had been so treated during several hours in moderately heavy weather. On three occasions, in the China Sea, I have come through typhoons unscathed without resorting to oil and other vessels that did make use of oil were lost, their crews almost to a man being sacrificed. Some captains, whose vessels carry big deckloads, spread oil to save their cargo from being washed overboard. The insurance underwriters would make a big fuss if anything happened should it transpire that oil was not employed.

"A gale continues many hours, say 24 or 36. The motorboat, assuming she has been caught with plenty of sea room and hove to, or, perhaps, just drifting in the trough, will go to leeward three or four miles an hour. A gallon of oil might be expended in a few minutes and the available supply would be exhausted long before the boat would naturally emerge from the ordeal, leaving her, therefore, to fight it out alone.

"Don't rely on oil. Get a stout sea anchor with plenty of riding line and the boat will be safe so long as she doesn't pitchpole, which doesn't happen once in 10,000 encounters with wicked water."

G. S. H., Boston, Mass.

Always Apply Oil to Windward.

WHEN a sea is so rough as to endanger a vessel, the proper use of oil on the water will materially add to her safety.

Heavy animal, vegetable, or mineral oils may be used and, while the former are better, good results can be obtained from the use of heavy mineral oils, such as the cheap cylinder oils, and they are much cheaper than animal or vegetable.

The danger to a vessel lies in the forward send of the sea, caused by the pressure of the wind on the back of a wave, which first appears as white caps. The oil slick does not lessen the height of the waves, but does to a large extent change the character of the sea, converting it into a swell, that will pass under a vessel, and not break on board.

To be of service, the oil must be so disposed as to form an oil slick to windward, which the sea will encounter before it reaches the vessel.

The oil can be conveniently carried in one or two gallon cans stowed out of the way, and the amount to be carried need not be over six or eight gallons, the expenditure per oil bag being about one gallon per hour. In addition provide two or three stout canvas bags nearly filled with loosely packed oakum or cotton waste, and pierced near the bottom with holes about ⅛-inch diameter. Each bag should have about 4- or 5-fathom piece of small line.

C. S. STANWORTH, Norfolk, Va.

Suggests It for Ordinary Use.

VERY few of us realize how simple it is and how much benefit can be derived by the use of a very little common lubricating oil when applied to the troubled waters that are often met during our every summer experiences. Consider, for example, the number of times that we have attempted to come alongside of some lee wharf or pier-head with only an ordinary breeze blowing, or have attempted to put the ladies aboard of the dinghy with the waves slapping up against the side of the boat or wharf, and between it and dinghy, and the thorough wetting that we all invariably received. And there are times when other than our personal comfort are at stake, times when by the knowledge of the use of oil, property or even lives might have been saved, such as crossing a bar during a blow or riding out a gale when no safe port was near.

The heavy thick oils, slightly warm, are the most effective and spread over the surface of the water to the most advantage. Kerosene and gasoline are of little use. Canvas bags holding a gallon or two, having a few holes punched through the canvas to allow the oil to slowly leak out, should be hung in the water from that part of the boat subjected to the greatest force of the storm.

An effort should be made to make the oil spread to the windward and, if this can be done, a very small quantity of oil will suffice to prevent the on-rushing waves from breaking over the boat. When attempting to cross a bar or shoal it should be approached in the direction of the tide or current, if possible, and the oil thrown out so that it will drift in ahead of the boat. When it is desired to lower a dinghy in a bad breaking sea to pass from one boat to another, the oil should be thrown from the windward boat, the dinghy lowered from the leeward boat. The leeward boat should then proceed to the windward and use oil to protect the return of the dinghy.

Oil is of great service when towing and may often prevent the parting of hawsers. It should be remembered that the effect of oil on breaking waves in shallow water is uncertain and should not be counted on too much, as nothing can prevent the breaking of waves where the whole mass of the liquid is in actual motion.

The following table shows the correct positions for the oil bags under various conditions:

BOAT'S POSITION	POSITION OF OIL BAGS
Drifting before a gale.	On both sides of bow.
Drifting in a trough.	Several along weather side and one at lee quarter.
Sailing before a gale.	On both sides of bow and both sides aft of greatest beam.
Sailing against a gale.	At weather bow and on forward deck.
Lying to in a gale.	Forward on windward side or along on both sides.
Hove to.	Along weather side and lee quarter.
Lying to a sea anchor.	Oil bag made fast to sea anchor hawser midway between anchor and boat.
Towing.	Forward and on both sides of tow boat.

LESTER WASLEY, Norwich, Conn.

Advises the Use of a Thick Oil.

A THICK non-congealing oil upon the surface of rough water will effectually prevent high breaking crests and steep sides. Animal and vegetable oils have been used with the best results, although cocoanut oil and some kinds of fish oil must be mixed with mineral oil to prevent thickening rendering them useless. Crude petroleum or cylinder oil may be used in warm weather.

Running into a head sea use oil as far forward as possible and run slow enough to keep within it. If hove to, use oil at the weather bow. Running with the sea abeam, use oil along the weatherside; and, if in a cross sea, use along both sides. Running with a following sea, where there is a tendency to yaw badly, use oil forward and alongside. If lowering or taking aboard a boat, riding to anchor or sea drag, beaching in the surf, going alongside wharf or float, where water is rough, use oil. To cross a bar among combers and rollers use a generous amount of oil forward and give it a good chance to get well ahead and actually see that it has the desired effect before getting too close, then ride over on the back of a big swell at full speed ahead. If the water is deep enough the stunt is not so bad, but there is plenty of danger, and such an attempt should not be made unless necessary. There are many other cases in which oil may be used to advantage.

Protectors or canvas oil bags about one foot long, filled with oakum and oil, and lowered overside by lanyards, are commonly used to distribute the oil, which oozes out through holes pierced by a coarse sail needle. Closet bowls and sinks stuffed with oakum or waste through which oil is poured serve well some times. My ideal is a system of copper tubes running from a hand or engine operated pump to the bows, sides and quarters of the boat, and controlled from the operator's station by valves to eliminate the necessity of hazardous climbing about or leaving the wheel when alone.

In the absence of better equipment the hand oiler or squirt can may be used with engine oil, and if not enough a larger can may be opened and the oil poured out freely.

Oil having collected in the bottom of the boat and passing out through the bilge pump has unexpectedly calmed rough water.

HOWARD G. PAGE, Shirley, Mass.

Vegetable Oils are the Best.

RUNNING before a gale, use oil from bags at the catheads, or from forward waste pipes; if yawing badly and threatening to broach-to, use oil after and abaft the beam, on both sides. When lying-to, distribute oil from the weather bow. With a high-beam sea, use oil bags at regular intervals along the weather side. In a heavy cross sea, have bags along both sides. Steaming into a heavy head sea, use oil through forward closet pipes. There are many other cases where oil may be used to advantage, such as lowering and hoisting boats, riding to a sea anchor, crossing rollers or surf on a bar, from life-boats and if stranded on bar. The thick and heavy oils are the best. Mineral oils are not so effective as animal or vegetable oil. Raw petroleum has given favorable results, but is not so good when refined. Certain oils, like cocoanut oil and some kinds of fish oil, congeal in cold weather, and are therefore useless, but may be mixed with mineral oils to advantage. As a general rule, probably the best way to use oil is by filling the closet bowls forward with oakum and oil, letting the oil drip out slowly through the waste pipes. Another simple and easy way to distribute oil is by means of canvas bags, about a foot long, filled with oakum and oil, pierced with holes by means of a coarse sail needle, and held by a lanyard.

GEORGE C. FARR, New York City.

A Submarine Pleasure Craft.

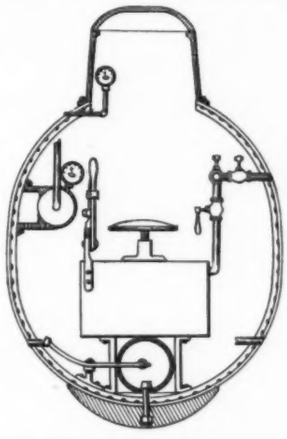
An Interesting Pittsburg Product Embodying What is Probably the Smallest Submarine Ever Built. The Opening of a New Field for Sport on the Water.

A SUBMARINE pleasure craft is the latest fad in motorboat building in Pittsburgh. In view of introducing this new sport and with some expectation of adding another establishment to the city's wide range of diversified industries, Pittsburghers have caused a design to be made for a trim little submarine runabout calculated for use on the local rivers.

Although the design calls for perhaps the smallest practical submarine ever planned, it nevertheless will be staunch enough for use on the Great Lakes and for ocean-going in moderate seas. Its builders believe that it will become popular and that many devotees of the deep sea sport will be gained. The suggestion has been made to the Pittsburgh Industrial Development Commission that the boats could be manufactured in Pittsburgh to advantage since they will be constructed entirely of steel, and the electric motive power could be installed by the great electric concerns here.

The design, made by Alexander F. Humphrey, an inventor whose submarine torpedoes and other devices were favorably considered by the United States War and Navy Departments, calls for a craft 16 feet in length and 4 feet 10 inches in diameter. This permits action in most rivers. It would cost from $1,200 to $1,500 complete.

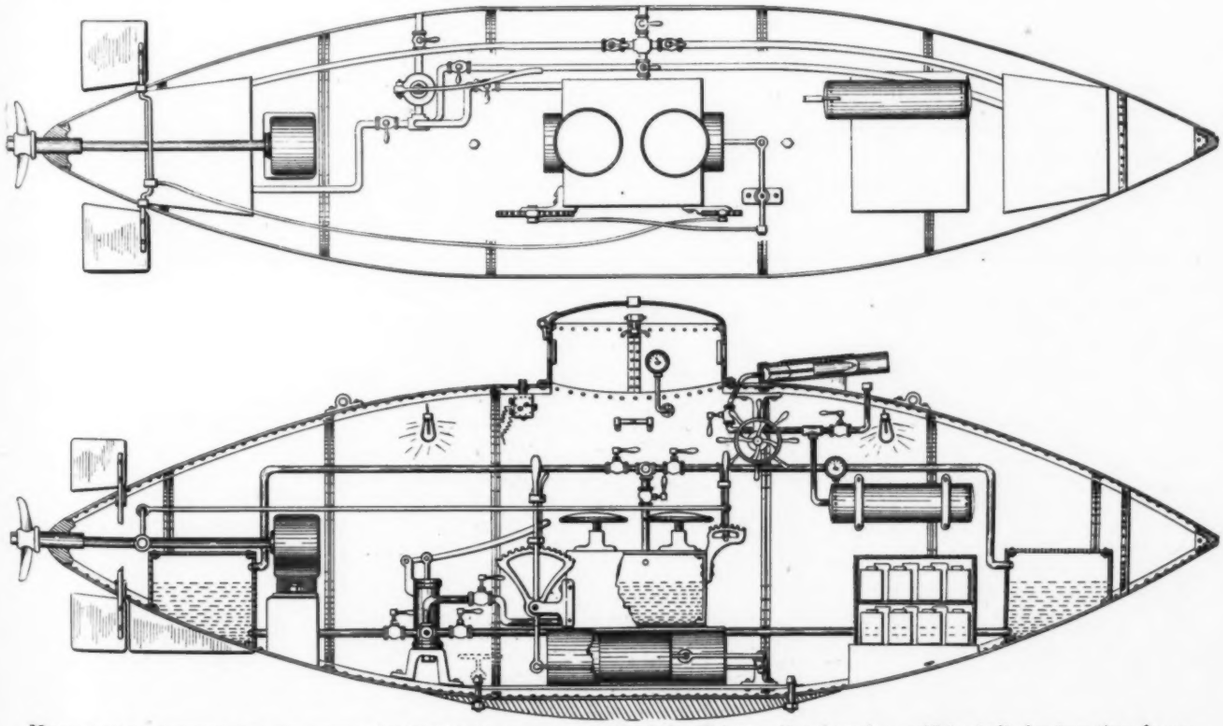
To submerge or to bring the boat to the surface horizontal rudders are used, with the assistance of what may be called a sliding weight, which quickly displaces the center of gravity. Trimming is done by means of the fore and aft tanks. A small storage battery supplies the energy to the electric motor which propels the craft. Air for the interior is supplied from a compressed air tank, and should the air pressure become a fraction above normal an automatic device at once starts to expel the surplus. Foul air may be driven out by the same means. In case of danger or accident the boat may be quickly brought to the surface by turning compressed air to the trimming tanks and driving out the water therein.



A small hand pump is installed to expel water from the emergency tank in the center of the boat. As a further means of safety the weighted keel may be released and dropped, this being accomplished by unscrewing the bolts from the center of the boat.

The craft is intended to carry two persons in its crew. The quarters are small, but comfortable. Plans are made for installing a motor that will drive the boat at a speed of about nine miles an hour on the surface and better than six miles an hour when submerged. It will be capable of making more than a mile under water without coming to the surface. In his design Humphrey has drawn a small pneumatic gun fancied to hurl a dummy aerial torpedo to be used in signaling or in aquatic sports and mimic warfare.

This will be the first submarine to be built in Pittsburgh. Although an inland city Pittsburgh has long taken an important place in the building of light river craft, some of its stern wheelers being used on the rivers of South America and Central Africa. Several gunboats ordered by a South American government are now in course of building here.



Motor boating beneath the sea seems destined to become a popular fad. This small submarine will be built for less than $1,500 complete.

NEW MOTOR BOAT DESIGNS

A Forty-Footer.

THE raised-deck cruiser which is under construction by the Milwaukee Yacht & Boat Company, of Milwaukee, Wis., for Mr. Will M. Hough, a prominent Chicago playwright, is shown upon the accompanying plans. The dimensions of this boat are 40 feet over all, with a 35-foot length upon the load water line, a 10-foot beam and a draft of 3 feet, 9 inches. The vessel has been designed for deep sea work and for this reason her lines may appear a trifle odd for a vessel of this size. All the decks have been kept flush with a heavy flare in the bow section and a sufficient deadrise in the underbody to make an able sea-boat and an unusually dry one in heavy weather. The bridge is equipped complete with one-man controls located a trifle forward of amidships, under a removable awning extending aft to the signal mast. In extremely bad weather, however, the boat may be handled from a wheel upon the stern deck.

A large double stateroom is entered from the after deck through a central companionway and upon the port side is a double berth fitted with a box spring and mattress. Opposite this, across the companionway entrance is an extension transom. Both of these have lockers above and are provided with two full-length clothes lockers opening in the stateroom on either side of the vessel. This locker space is a point to which much attention has been given in the entire construction of the vessel and there is no space wasted.

A heavy curtain separates the stateroom from the saloon, which is finished in selected Honduras mahogany and finished with two extension transom berths, one upon either side. Silverware lockers and glass lockers with heavy doors are located above these berths and a folding dining table is placed in the center of the saloon. A desk and bookcase are at the forward end. A toilet room finished in white enamel opens from the starboard side of the saloon, the space being taken out from the engine room and balancing the port side of the vessel, which provides entrance to the engine room from the saloon, and a seat with a berth over it.

The engine room is located directly under the bridge deck and contains a 20 h.p., Twentieth Century motor, which will give the boat a speed of about eleven miles per hour. This engine room is unusually well equipped and contains a work-bench upon the starboard side and lockers underneath. Upon the port side is the seat and berth previously referred to and at the forward end of the engine room the vessel is divided by a bulkhead, separating this room from the galley. This galley is equipped with dish-lockers, a sink, an oil stove and a large ice-box, which may be filled from the deck.

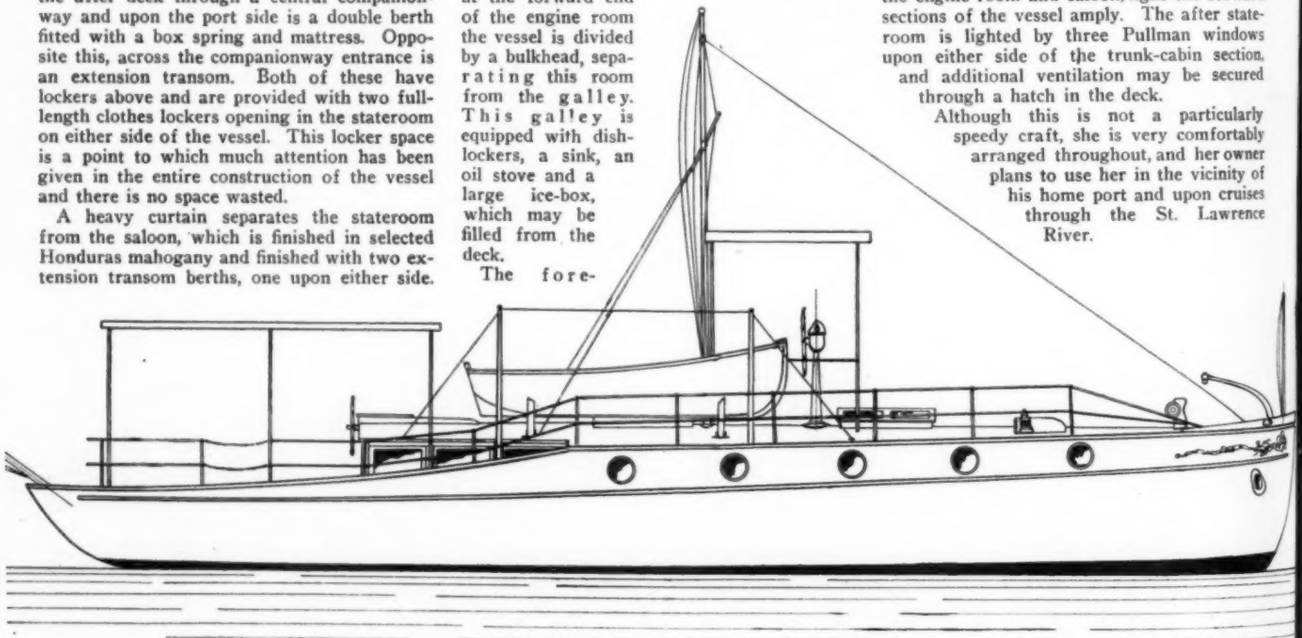
The forepeak is very large and affords plenty of room for lines, tackle, lanterns, etc., and a chain locker.

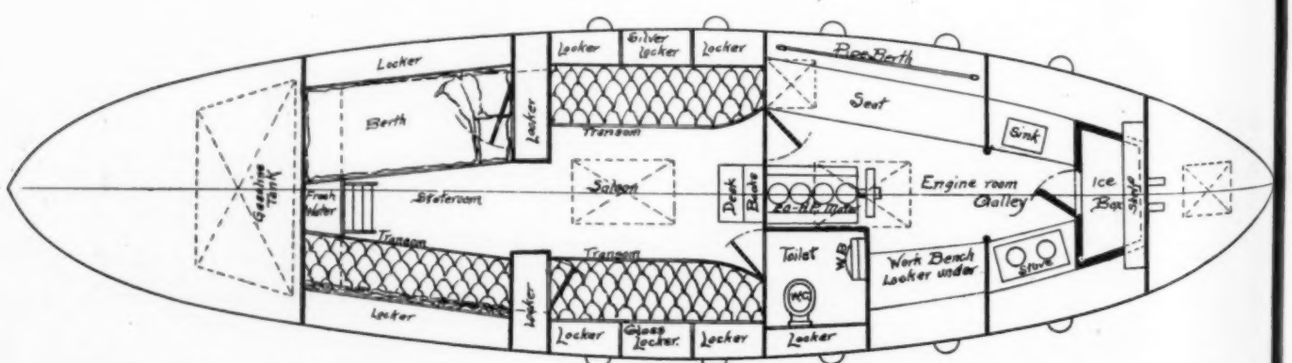
As may be seen from her lines, the vessel is primarily a raised-deck type and she has no cockpit, the under-deck providing space with her flushed-deck construction, however, for a number of chairs. A dinghy is carried upon davits aft of the bridge deck, and awnings cover the flush-deck sections of the craft.

Vessels of this type have become very popular upon the Great Lakes, although the protected bridge is somewhat of a novelty. The boat can be operated by one man, and she can be handled either from the bridge or from the after deck, as desired. This eliminates the necessity of separating the owner from the remainder of the party if, as is often the case, it is not found advantageous to take a crew along upon a short trip.

A skylight forward of the wheel and binnacle and five port lights upon either side of the engine room and saloon, light the forward sections of the vessel amply. The after stateroom is lighted by three Pullman windows upon either side of the trunk-cabin section, and additional ventilation may be secured through a hatch in the deck.

Although this is not a particularly speedy craft, she is very comfortably arranged throughout, and her owner plans to use her in the vicinity of his home port and upon cruises through the St. Lawrence River.





This craft, designed by the Milwaukee Yacht & Boat Co., will be used on Lake Michigan and is fitted for deep sea work.

Another V-Bottom Runabout.

THE boat whose designs are shown upon this page is the product of the Bath Marine Construction Company, Bath, Maine. It is a runabout of the V-bottom type with an overall length of 21 feet, 9 inches, a water-line length of 21 feet, 6 inches, and an extreme beam of 4 feet, 11 inches. The freeboard at the bow is 2 feet, 8 inches, and the entire construction shows a boat that is unusually roomy for her length.

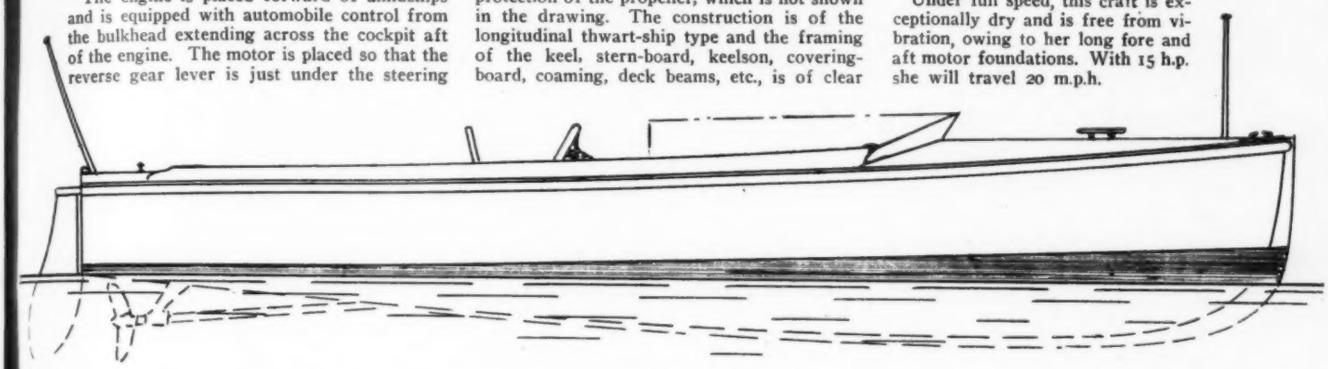
The engine is placed forward of amidships and is equipped with automobile control from the bulkhead extending across the cockpit aft of the engine. The motor is placed so that the reverse gear lever is just under the steering wheel, so that it is always within easy reach of the operator.

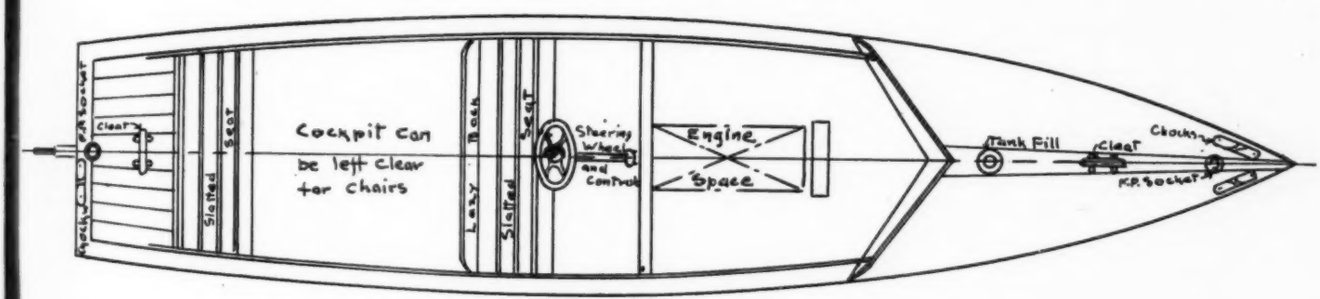
As shown in the drawing, the boat contains two thwart-ship seats, the one amidships being equipped with a lazy-back and the after seat occupying the entire after section of the cockpit.

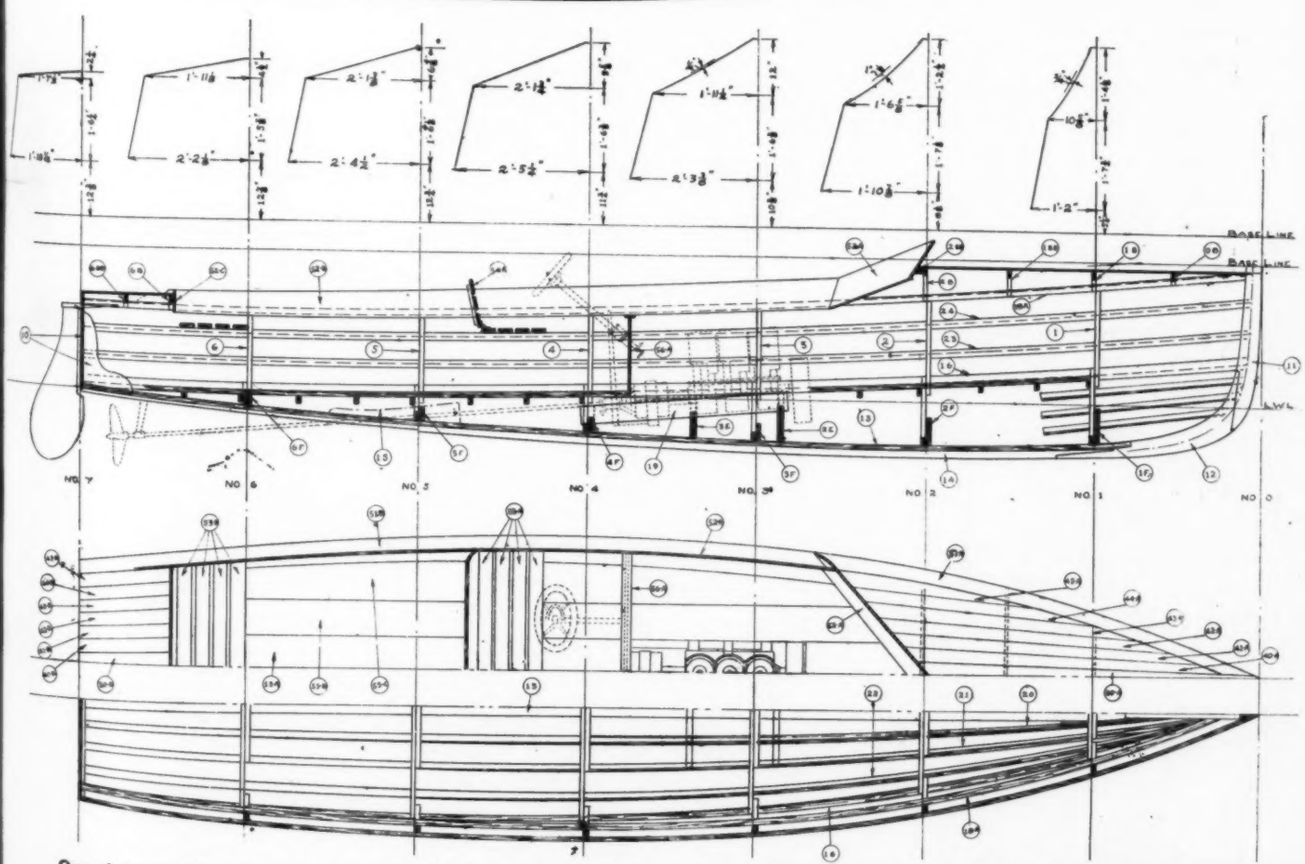
This boat is being made as a stock model and is furnished either with or without the engine cover and with or without a skeg for the protection of the propeller, which is not shown in the drawing. The construction is of the longitudinal thwart-ship type and the framing of the keel, stern-board, keelson, covering-board, coaming, deck beams, etc., is of clear white oak. The planking is for the most part of white pine or Maine cedar, copper-fastened to the stringers and brass-screwed to the frame.

The stringers are of spruce, let into notches in the frame and notched also into both ends of the stem and stern-board. The seats and also the backs are of hardwood, well finished, and they add greatly to the appearance of the boat.

Under full speed, this craft is exceptionally dry and is free from vibration, owing to her long fore and aft motor foundations. With 15 h.p. she will travel 20 m.p.h.







One of the speediest boats for her power built. 10 h. p. will drive her at 15 miles per hour, and she is particularly good in a seaway.

A 75-Foot High-Speed Cruiser.

THE Matthews Boat Company of Port Clinton, Ohio, has recently designed for a Detroit yachtsman, the 75-foot cruiser whose plans are shown below. This vessel has a beam of 10 feet and a draft of 3 feet, 6 inches, and presents some attractive features not usually found in craft of this type, since neither speed nor comfort have been sacrificed.

The crew of three, which is required to handle the vessel, is accommodated forward, being separated entirely from the owner's part of the boat. A dining-room and a galley follow these quarters, a watertight steel bulkhead being fitted between the crew's quarters and the dining saloon.

Special chairs and a folding yacht table are provided in the dining saloon with two emergency folding berths installed under the side deck, so that space may be used for sleeping accommodations if necessary. An ornamental buffet and chart locker and general lockers are arranged about the sides of this compartment.

The galley, which is just aft of the dining saloon upon the starboard side, is fitted with a three-hole stove and the necessary fittings.

Gasoline tanks of 500-gallon capacity are installed between watertight steel bulkheads, the tanks draining outboard.

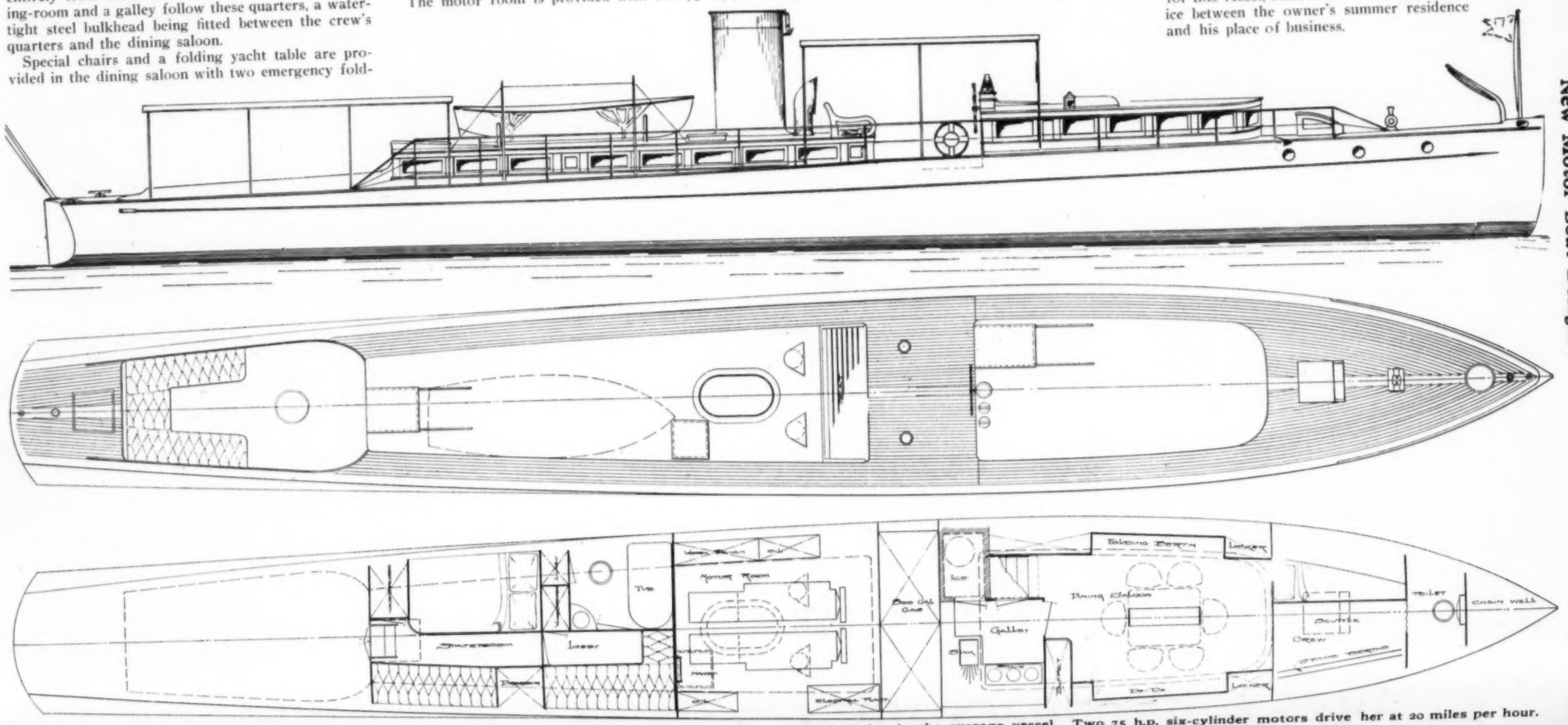
The motor room is provided with two 75 h.p., 6-cylinder motors, an independent electric lighting plant, a work-bench and the necessary lockers. The stack, ventilator and Pullman windows furnish ventilation for this compartment. The engine room also is located between steel bulkheads.

The owner's quarters at the after end of the vessel are provided with a stateroom the full width of the boat and equipped with a double bed and single bed, besides a wardrobe and a dresser. The bathroom is located just aft of this with a lobby equipped with a wide sofa berth.

It will be noted that the entrance hatch in the engine room and dining saloon are upon opposite sides of the vessel from that usually found, since as the boat will be used principally on the Detroit River where the current is rather swift, she will be obliged to dock in almost every instance with her bow upstream. The entrances have, therefore, been placed upon the port side rather than upon the starboard side, as usual.

The prinicpal feature of this vessel is the large amount of outside deck room aside from the cockpit at the after end.

A speed of 20 miles per hour has been guaranteed for this vessel, since she will be used largely in service between the owner's summer residence and his place of business.



This Matthews craft is built upon speedy lines and has comfortable accommodations as well, an unusual combination in the average vessel. Two 75 h.p. six-cylinder motors drive her at 20 miles per hour.

This Matthews craft is built upon speedy lines and has comfortable accommodations as well, an unusual combination in the average vessel. Two 75 h.p. six-cylinder motors drive her at 20 miles per hour.

"Dido," a Sixty-Five-Foot Cruising Yacht.

"DIDO" is being built for Mr. Chas. S. McCulloh, by the Salisbury Marine Construction Co., of Salisbury, Md., from designs by J. Murray Watts, N. A., of Philadelphia. This boat is 65 feet over all, 61 feet water line, 13 feet beam, and 3 feet 8 inches draft. She is remarkable for the unusually large accommodations below decks and the good head room, the latter throughout the owner's quarters being 7 feet and under the bridge deck 6 feet.

The arrangement below decks shows a very large double stateroom aft with two double beds nearly 4 feet wide. These beds have drawers under, and, together with the two wardrobes and the bureau, give plenty of storage room. There is a mirror over the bureau and a full length mirror in the stateroom door. The stateroom is 11 feet long and nearly 12 feet wide. There is a passage leading from the stateroom of the main saloon, and on the port side is an 8-foot bathroom with wash basin, toilet, bath tub and shower bath, all arranged for hot and cold water.

On the starboard side of the passage is a guests' stateroom with a single bed and a wardrobe, bureau and wash basin. The bureaus in either stateroom are so arranged that there is an upholstered sliding seat in the shape of a narrow drawer, which can be pulled out and slid back out of the way when necessary.

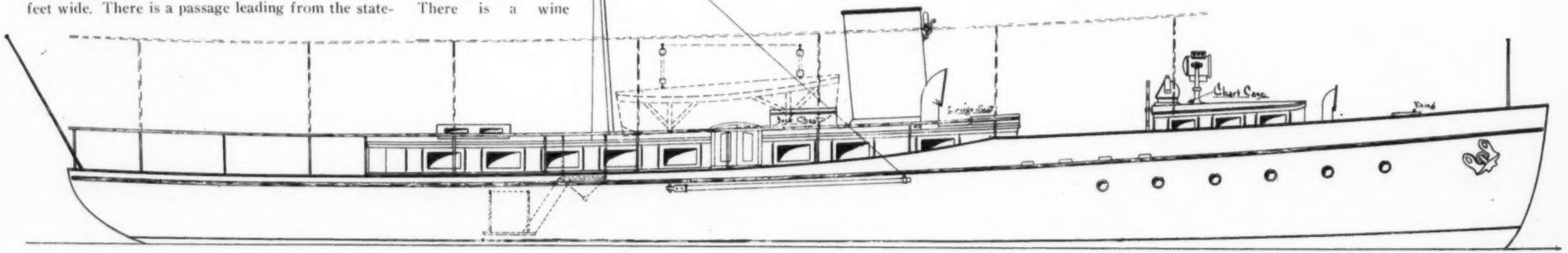
The main saloon is 8½ feet long by nearly 13 feet wide, and has an extension transom on either side. There is a wine locker and buffet to port conveniently located and a flight of steps to starboard. These steps lead up to the main deck. Forward of the main saloon is a gallery with ice-box, Shipmate stove and sink, and the usual plumbing.

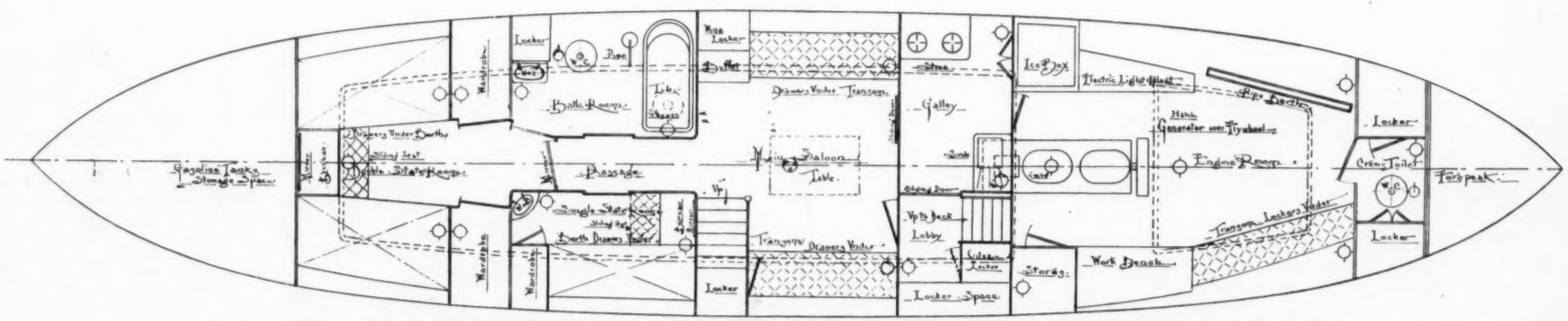
On the starboard side is a lobby with steps leading to the bridge. This lobby has large china and glass lockers and can be used as a pantry. Forward of the galley is the engine room with a work-bench and locker for engine stoves on the starboard side, and a switchboard for the electric light plant on the port side.

The main engine is a heavy duty Sterling motor with a 6-inch bore and an 8-inch stroke. A 1½ K.-W. Holzer-Cabot generator is belted to the flywheel of this motor and supplies current for the storage batteries and for the 12-inch Carlisle & Finch searchlight.

The crew's quarters are forward of the engine room and there are berths for three men, with lockers and a toilet room with wash basin and toilet located forward.

The outside joiner work on this boat is mahogany and the owner's quarters are finished in paneled mahogany throughout, even the deck carlins being mahogany. The outboard profile shows a good seaworthy type of craft, flush decked throughout, except for the two deck houses. There is a 16-inch bulwark forward, running back beyond the bridge. On this bridge is located the steering wheel, binnacle, chart case, reverse lever and engine control. Twelve miles per hour is obtained with the 60 h.p. motor.





Dido can maintain 12 miles per hour and is a powerful craft. She is from the boards of J. Murray Watts and will doubtless cruise along the coast.

A Raised Deck 33-Footer.

IN the design below is shown a craft which is under construction at the yards of G. R. Richardson, North Tonawanda, N. Y., for James Blackmer, of Buffalo, who will use the vessel on the Niagara River and Lake Erie.

The boat is of the raised-deck type and is 33 feet, 2 inches over all, with a water-line of 29 feet, 11 inches, and a beam of 8 feet, 6 inches. She is of fairly heavy construction, but is so built as to maintain a good speed in a seaway, and in no place is seaworthiness sacrificed. The entire frame construction is of white oak with planking of 7/8-inch cypress and galvanized iron fastenings.

The arrangement is so laid out that four people can be comfortably accommodated and for small cruising parties, the craft is an exceptionally desirable one, since the sleeping quarters are forward and separated from the cockpit by the working parts of the boat.

The fresh-water tank is carried in the extreme forward section in the forepeak. This tank is removable, so that if it is not found desirable to carry fresh water along on cruises, the space may be used for stowage. Under the tank, the space is left for chains and ground tackle for the anchor. Aft of this is a space reached by a hatch from the deck which provides shelves for miscellaneous articles and a clothes locker.

The cabin is 8 feet in length and contains two wide berths, the back of which swing up and form upper berths if a larger party is to be accommodated. The engine room is next aft and this also contains the galley fittings. A sink and a stove are upon the starboard side and the rest of this space is occupied by steps leading to the cockpit upon the port side with a toilet room and an ice chest, both opening into the central apartment, in which is located the motor.

The motor is a four-cylinder 18-25 h.p. model B Sterling, equipped with a Bosch high-tension magneto. It is located just forward of the cockpit bulkhead, with one cylinder extending aft under the cockpit floor so that the motor occupies no more room than is absolutely necessary. It is, at the same time, accessible and is located so that the controls may be easily extended up through the deck to the wheel just above.

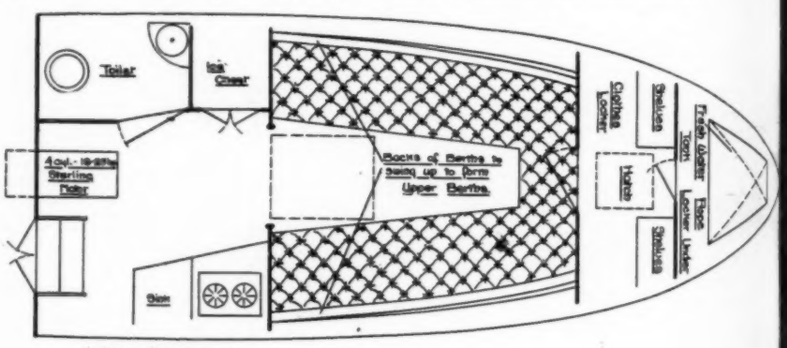
A feature which will be appreciated in early spring and in late fall cruising is the heating arrangements by which the cooling water from the motor is used to heat the forward cabin when necessary. It is accomplished by means of a small radiator, which is situated under the forward locker and which may be operated similar to any hot-water radiator where such a system is used. The heating properties of the motor are ample for this purpose and with the hatches and ports closed except sufficient for ventilation, ample warmth can be secured even in the coldest weather.

The cockpit, which is entered from below by a short flight of steps covered with a sliding hatch, is 9 feet, 6 inches in length and is arranged to accommodate a number of wicker chairs in addition to the wide seat at the stern with a lazy-back built in aft. The stern deck is sufficiently large only to carry the necessary bitts and mooring ropes so that the remainder of the vessel is entirely open for the use of those on board. The gasoline tanks are located on the rear cross-seat and have a capacity of 80 gallons. The cockpit is of the self-bailing type and is unusually large for a boat of this size. The craft will carry a signal mast, the location of which is shown in the design, a dinghy, two anchors, an Anrade automatic windlass, which is rigged for one chain, a rope, an awning over the cockpit and the usual deck fittings. The cabin and engine room together have four portholes upon a side and further ventilation is secured through the skylight and through the companion hatch over the entrance at the aft end of the engine room.

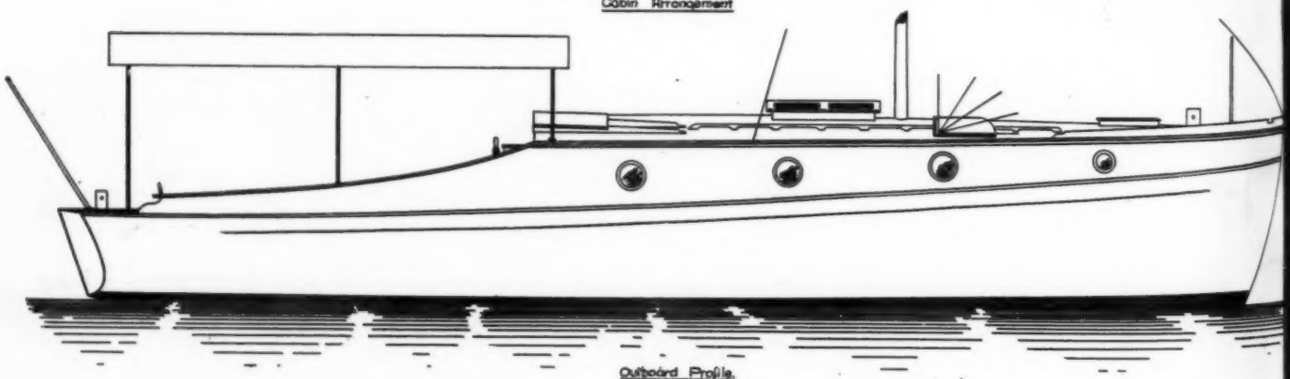
All the outside bright work will be of white oak and the cabin interior will be finished in white enamel. A complete electric lighting outfit will be installed, including running lights.

This cruiser is of a typical raised-deck type and provides a large amount of locker space and closet room for the use of those aboard. She has a good flare forward which will make her a dry boat, even in rough water, and as the steersman's position is almost in the center of the beam and some distance aft of amidships, he can keep as dry as those in the cockpit, all water being thrown aside by the flare of the bow before it reaches this point.

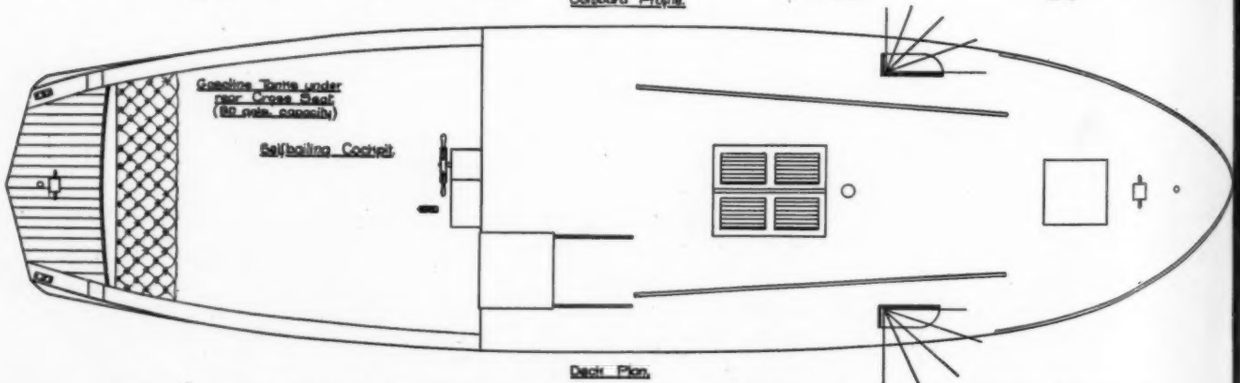
Most of the cabin space is occupied by the berths, as these are unusually wide and comfortable. A door opens into the forward compartment so that access may be gained to the lockers and shelves which are provided thus in a convenient position, but sufficiently out of the way to prevent their detracting from the appearance of the cabin interior.



Cabin Arrangement



Outboard Profile.



Deck Plan.

This cabin cruiser, for Mr. James Blackmer of Buffalo, is of a comfortable type and will accommodate four people.

A 38-Foot Cruiser.

THE plans shown below are from the boards of W. E. Anderson, Albuquerque, New Mexico, and show a 38-foot cruiser with a beam of 9 feet and a draft of 3 feet under way, which is designed for use upon the Great Lakes.

The motor is installed amidships and is a four-cylinder, 35 h.p. type, which will give the vessel a speed of about ten miles per hour. The motor is conveniently located, the motor compartment being provided also with electrical equipment and has a work-bench and a switch-board upon the port side.

Each compartment of this craft is of ample size with full headroom. The galley is forward, just aft of the ice-box, and contains a sink upon the port side and a two-burner stove upon the starboard side. Aft of the galley is the forward cabin, which has two transoms with drawers and a drop-leaf table in the center of the compartment. The after part of the motor room upon the port side is divided into a toilet room, having entrances from the motor compartment, as well as from the after cabin, and the starboard side of the motor room is occupied by a 45-gallon gasoline tank and a locker. The exhaust is led up through the stack. A seat is built over the gasoline tank so that it can be used for a berth if necessary.

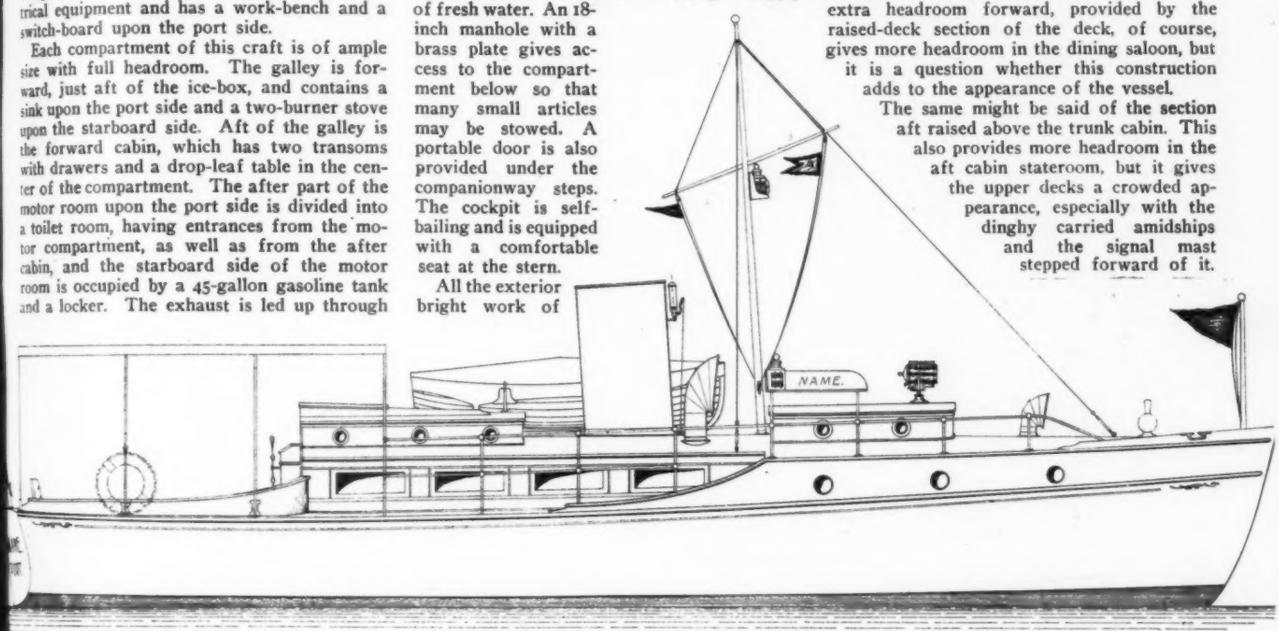
Aft of the motor compartment is the cabin, which is equipped with two wide transoms, having extensions and drawers under them and also a dresser at the forward end. The interior finish of this room is white enamel and mahogany.

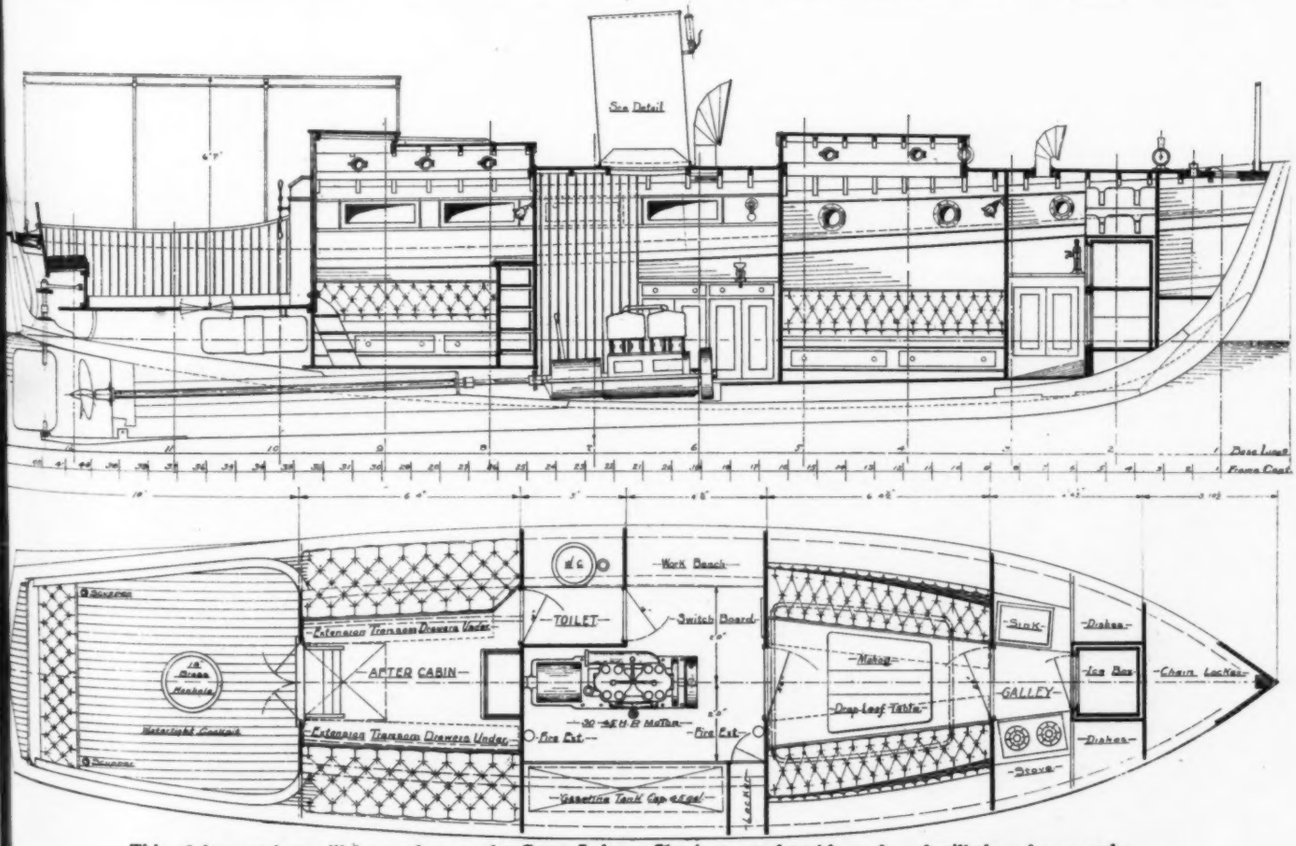
A large cockpit occupies the remainder of the vessel and underneath the floor of this are two cylindrical tanks, each holding a supply of fresh water. An 18-inch manhole with a brass plate gives access to the compartment below so that many small articles may be stowed. A portable door is also provided under the companionway steps. The cockpit is self-bailing and is equipped with a comfortable seat at the stern.

All the exterior bright work of this vessel is mahogany, with fittings of polished brass. The top sides of the hull will be painted a steel gray with gold leaf scroll, and the underbody will be the regular marine green. The boat will be fully equipped with a 9-foot dinghy and all accessories, and will carry a signal mast and a yard-arm just forward of the stack.

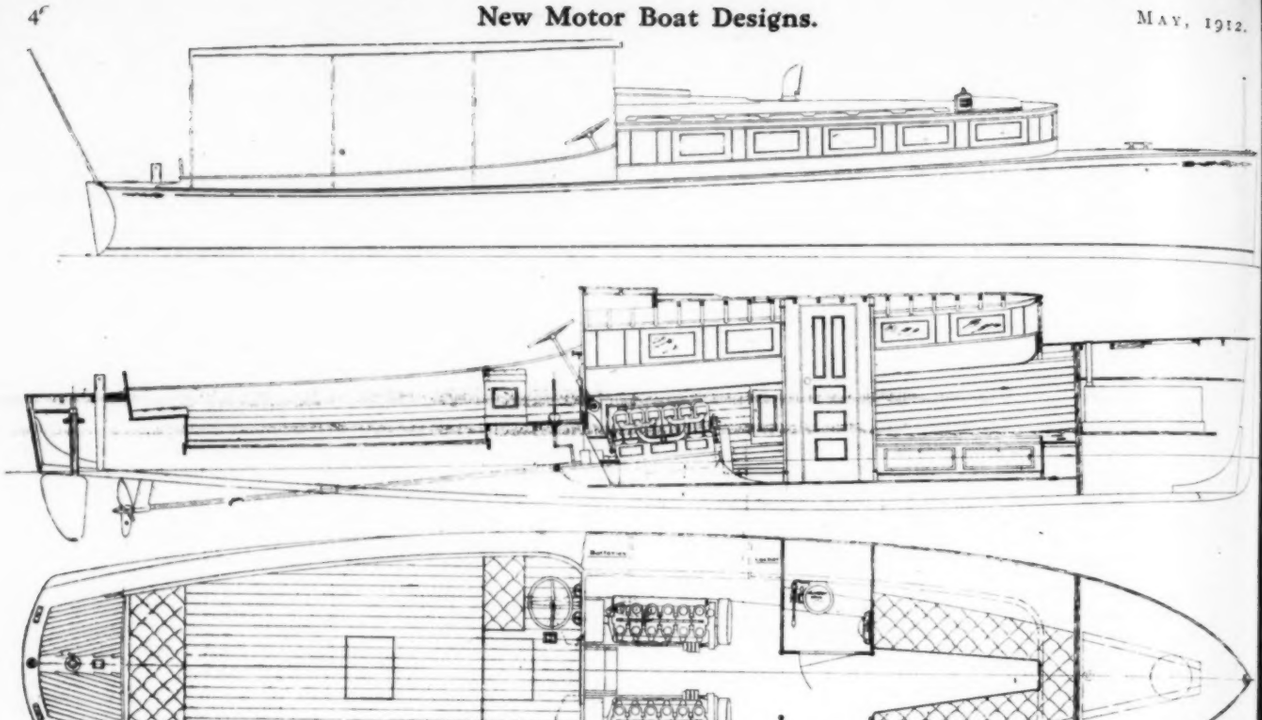
This vessel presents a combination of the raised-deck and trunk-cabin types with traditional deck erections over each type. The extra headroom forward, provided by the raised-deck section of the deck, of course, gives more headroom in the dining saloon, but it is a question whether this construction adds to the appearance of the vessel.

The same might be said of the section aft raised above the trunk cabin. This also provides more headroom in the aft cabin stateroom, but it gives the upper decks a crowded appearance, especially with the dinghy carried amidships and the signal mast stepped forward of it.





This 38-foot cruiser will be used upon the Great Lakes. She is a comfortable craft and will sleep four people.



Lillian S. can maintain with ease a speed of 18 m.p.h. and is a very comfortable craft. She has attractive lines.

Lillian S, a 40-Footer.

LILLIAN S., shown below, is a fast day cruiser designed by Bowes & Mower, of Philadelphia, for use in Florida during the winter and at Atlantic City during the summer. She is owned by Mr. G. C. Seidel and her construction was begun early in the fall of last year by John S. Shepard, of Essington, Pa.

It is designed primarily as a day cruiser and has an average running speed of more than eighteen miles per hour. With an unusual cockpit and a roomy cabin with full headroom, this craft should prove a very comfortable one. The cockpit is 14 feet, 6 inches long and is fitted with a wide seat at the after end, the forward part of the cockpit floor being raised 7 inches so as to make a sort of bridge deck and give the helmsman a clearer view from the cabin trunk.

The steering wheel is placed upon the port side on the cabin bulkhead, with spark and throttle controls and clutch lever placed so that the vessel can be handled by one man and can be controlled almost as easily as a motor car.

The after part of the cabin for a length of 6 feet, 6 inches, is occupied by the engine room, which is entered by a companionway leading to the passage between the two motors. Forward of this engine room on the port side is a toilet room and opposite this is the galley equipped with a sink and an alcohol stove. The cabin is forward of this and is provided with two transoms, 6½ feet long, which can very readily, when necessary, be made up as berths.

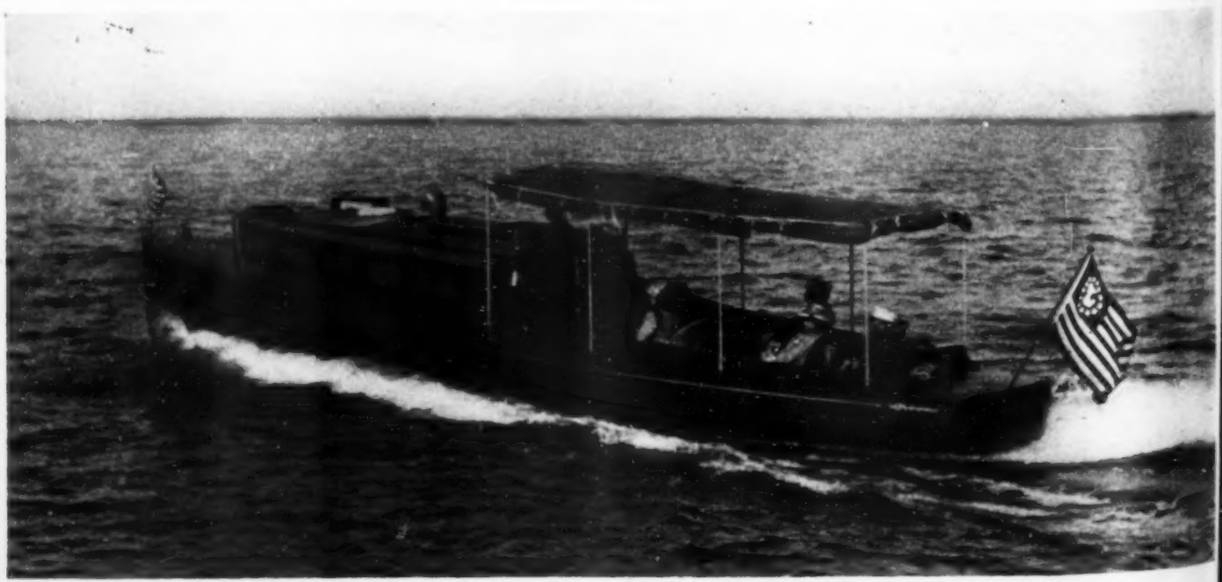
The vessel is driven by two six-cylinder Loew-Victor engines, developing 50 h.p. each, at 800 r.p.m. These engines on the trial trip gave the boat a speed slightly in excess of 18 miles per hour.

Lillian S. is painted black above the water line, with a white boot top, and a green underbody. The cabin trunk, planksheers and cockpit are finished in mahogany and the decks are in white pine.

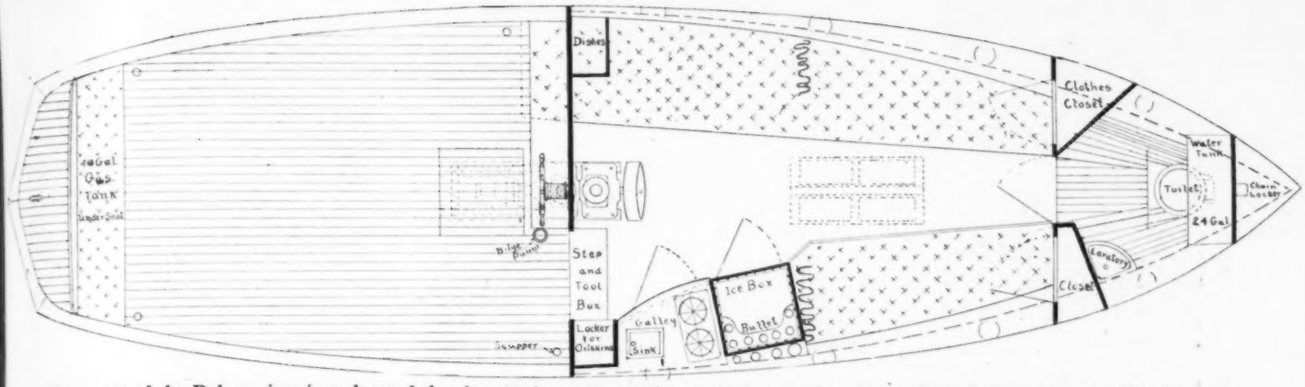
This vessel is of fairly heavy construction with ¾-inch cedar planking over inch-square steam bent oak frames and is thoroughly braced with longitudinal stringers. For use in Southern waters, skegs of a special design were fitted to protect the wheels.

This vessel was completed early in January and was given a trial upon the Delaware River by her designers, after which she was loaded on a flat car and shipped to Florida, where she remained until the close of the season. She has just returned north under her own power and it is expected that she will be entered in some of the races on the Jersey coast during the coming season.

The dimensions of Lillian S are as follows: Length overall, 40 ft. 10 in.; length water line, 40 ft. 2 in.; extreme beam, 9 ft.; extreme draft, 2 ft. 6 in.; draft of hull, 1 ft. 7 in.; bow freeboard, 4 ft.; stern freeboard, 2 ft. 6 in.



At full speed, Lillian S. rides very easily upon the water and makes the most of her excellent lines. She is easily handled with her automobile control.



The motor of the Dale cruiser is so located that it occupies no space that could be used for the comfort of those aboard. Yet the motor is easily accessible and is placed where one man can handle it.

A 30-Foot Stock Model.

THE design and photographs upon this page show a craft which is being built as a stock model by William L. Dale, 123 River Avenue, Bronx, New York City. While the type of boat is not strictly new, the bulk of the arrangement features and general lines show a number of useful and novel features, which are being incorporated for the first time in these new boats.

The craft is a 30-foot raised-deck cruiser, with an extreme beam of 8 feet, 4 inches; a minimum freeboard of 2 feet, 5 inches, and a maximum freeboard of 4 feet, 10 inches. These boats are being equipped with 15 h.p. Eagle, 9 h.p. Buffalo, or 12 h.p. Twentieth Century motors or any other make as may suit the wishes of the purchaser. The motor is installed at the after end of the cabin, with a portion of the rear cylinders under a small bridge deck, the top of which is hinged so that it will raise, giving access to the after end of the engine. To provide easy access to the reverse gear, a hatch is fitted flush with the cockpit deck.

The frames of this cruiser are of oak, 1½ x 1½ inches, steam bent, and the planking is of ⅞-inch cedar. The keel is of 4 x 6-inch oak and all other material used throughout the boat is of proportionate size and weight.

The cabin is unusually large for a 30-foot craft and is provided at the forward end with a toilet and lavatory separated from the cabin by a bulkhead. Opening into the cabin on either side of the toilet room door are two closets, one for clothes and the other being provided with shelves.

The transoms are arranged in the cabin to sleep three people. If desired, pipe berths can be placed over them to provide accommodations for three more. The ice-box is large and conveniently located with respect to the galley and the cockpit. The top of this ice-box is provided with a rail and rack, as it is designed to be used also as a buffet. The galley is located at the after end of the cabin, near the companionway, and here also is located a water tank to provide running water for the lavatory and sink.

The gasoline tank, which holds 40 gallons, is placed under the seat at the stern of the cockpit.

The boat steers from amidships and there are no raised hatches or other obstructions in the cockpit to interfere with making use of all the deck space or to hinder making landings on either side of the boat. This cockpit is of unusual size and will accommodate several wicker chairs.

The woodwork of the cockpit, cabin, bulkheads, doors, etc., is of cypress, paneled and given a cabinet finish. No ceiling is used except in the lower part of the toilet room, timbers and planking being so finished that access can be had to all parts of the boat.

The cockpit is of the self-bailing type and can be covered by a removable awning in stormy weather. This awning is not necessary, however, so far as the appearance of the boat is concerned, and as there is nothing in the cockpit to be injured by water, the awning is not supplied as a part of the standard equipment.

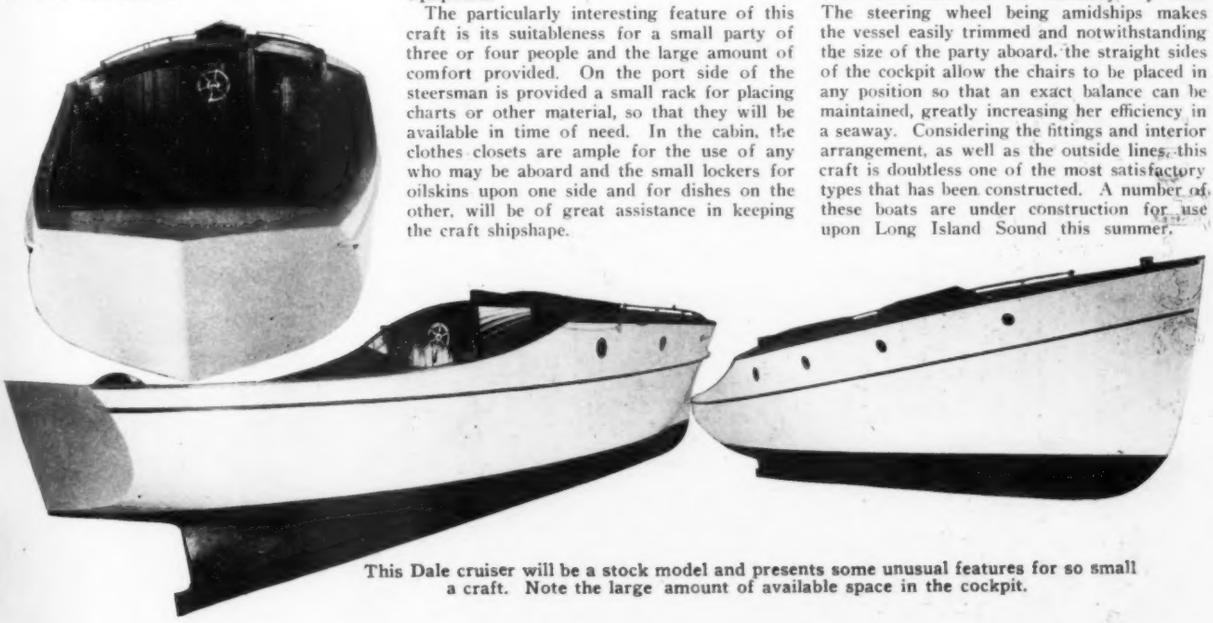
The particularly interesting feature of this craft is its suitableness for a small party of three or four people and the large amount of comfort provided. On the port side of the steersman is provided a small rack for placing charts or other material, so that they will be available in time of need. In the cabin, the clothes closets are ample for the use of any who may be aboard and the small lockers for oilskins upon one side and for dishes on the other, will be of great assistance in keeping the craft shipshape.

A hinged skylight is provided in the center of the cabin and this, in addition to the four ports upon either side, gives ample light and ventilation. The appearance of the vessel is improved by a brass hand rail extending along the top of the cabin from the cockpit to a point just aft of the forward bitts.

This type of vessel represents what is probably the most popular for a man of moderate means who wishes to occupy short occasional holidays or week-ends in cruising about the waters near his home. It is not an expensive vessel to operate, as the gasoline consumption is small and the upkeep is practically nothing. The cabin roof is watertight and when the hatch is battened down, no additional covering is neded when the boat is at her mooring. She can, therefore, be used for a day or so at a time and left in a suitable anchorage while her owner returns to his home by rail or other means to await the next available opportunity for making use of his boat to continue his cruise.

The cabin is even more roomy than the plans would indicate, and the exceptionally wide seat upon the port side makes a very comfortable lounging place. On the starboard side, although the seat is shorter, it is by no means uncomfortable, and a party of considerable size could be accommodated without inconvenience upon this vessel.

She will carry no signal mast or other outside fittings, as her length will not make this an improvement to her appearance. She has a good flare, however, and the deadrise forward will make her an unusually dry boat. The steering wheel being amidships makes the vessel easily trimmed and notwithstanding the size of the party aboard, the straight sides of the cockpit allow the chairs to be placed in any position so that an exact balance can be maintained, greatly increasing her efficiency in a seaway. Considering the fittings and interior arrangement, as well as the outside lines, this craft is doubtless one of the most satisfactory types that has been constructed. A number of these boats are under construction for use upon Long Island Sound this summer.



This Dale cruiser will be a stock model and presents some unusual features for so small a craft. Note the large amount of available space in the cockpit.

A 96-Foot Cruiser for Southern Service.

ANOTHER Matthews craft has been designed according to the plans shown below, by the Matthews Boat Company, of Port Clinton, Ohio, for Charles W. Ward, the owner of the 75-footer Ethel M. Ward, which was built by the same company some time ago. The interior arrangement of this new vessel is a development of the idea gained from Mr. Ward's former boat and, as this is designed particularly for southern service, it is a type that will prove interesting to those who have use for a boat in this section of the country.

The particular feature of this boat, which will be noticed when first studying the plans, is the large amount of outside deck room, which is furnished, however, with ample protection overhead, so that fresh air and coolness may be enjoyed without being exposed to the sun.

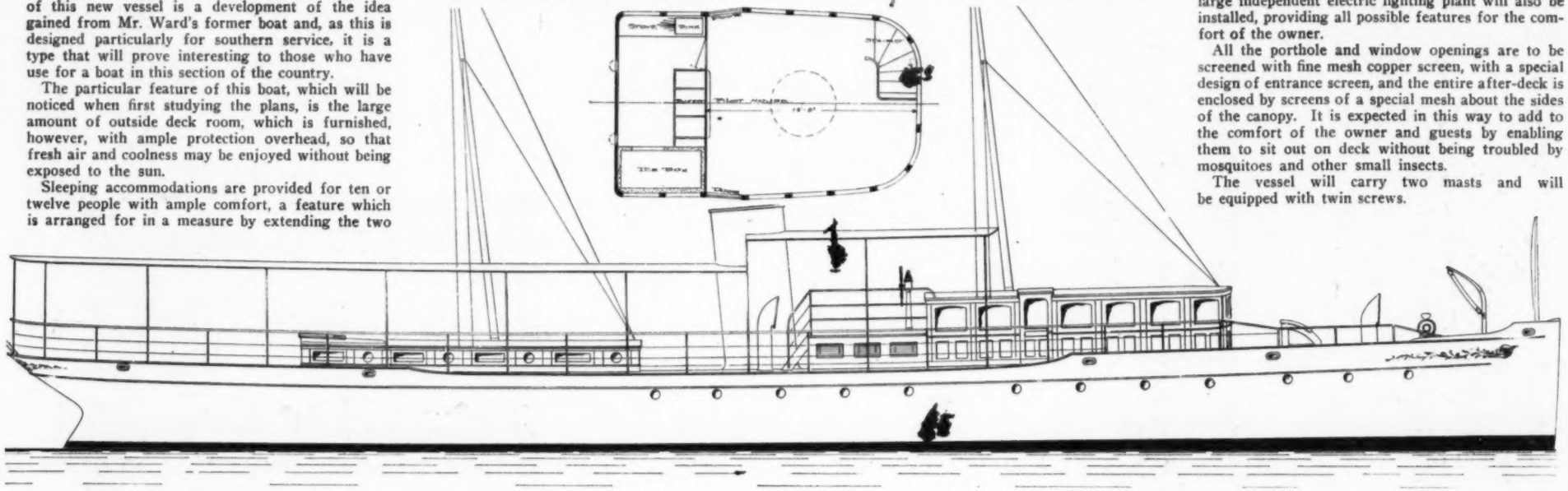
Sleeping accommodations are provided for ten or twelve people with ample comfort, a feature which is arranged for in a measure by extending the two central berths across the beam of the vessel instead of lengthwise, as is usually the case upon a craft of this type.

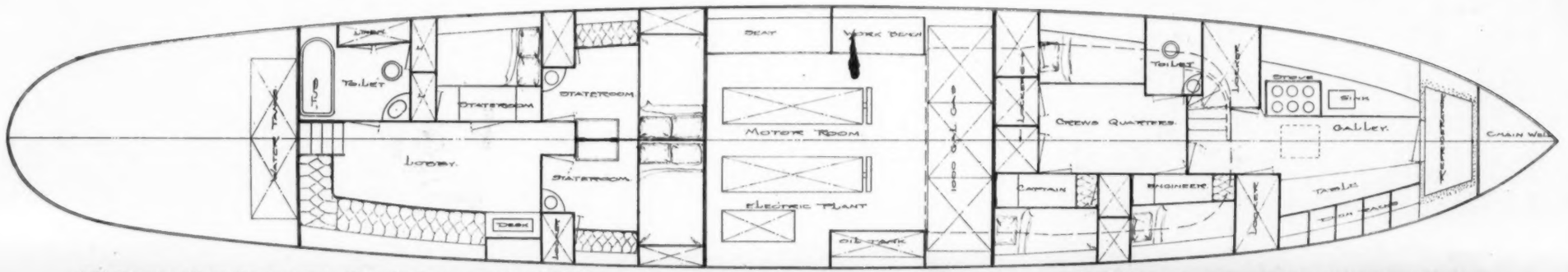
The boat will be built with substantial scantling throughout, the decks being yacht laid cork pine with mahogany deck houses and teak trimmed. The deck house interior will be finished in mahogany and the after quarters in cream enamel with mahogany trim.

Another feature in the construction that has worked out very satisfactorily is the fact that air space is provided under all the decks so that the quarters below are not affected to any great degree by the hot sun. This feature has been provided in all the flush deck sections over the engine room and over the crew's quarters. Special attention has also been given to ventilation and a forced draft by means of an electric fan is provided in all the rooms. A large independent electric lighting plant will also be installed, providing all possible features for the comfort of the owner.

All the porthole and window openings are to be screened with fine mesh copper screen, with a special design of entrance screen, and the entire after-deck is enclosed by screens of a special mesh about the sides of the canopy. It is expected in this way to add to the comfort of the owner and guests by enabling them to sit out on deck without being troubled by mosquitoes and other small insects.

The vessel will carry two masts and will be equipped with twin screws.





A Matthews craft for Southern use. Note the large amount of deck space, all the covered portions of which will be thoroughly screened. She has twin screws and will accommodate ten persons.

Yard and Shop

At the yard of the Matthews Boat Co., Port Clinton, Ohio.

The New Wigwam II.

The Pacific Coast is rapidly coming to the fore in the building of fast racing craft. Close upon the news of the performance of the Oregon Wolf comes the story of the trial trip of the reconstructed Wigwam II, of Astoria, Oregon. The rebuilt Wigwam II is practically a new craft throughout. The rounded bilge which formerly characterized the hull, has this year given way to a square bottom. The hull has also been built shorter and strengthened to carry a heavier engine. The motor this season is a six-cylinder, 6 x 5-inch, 120 h.p. Leighton, with a speed of from 1,200 to 1,400 r.p.m. A striking feature is that the engine is offset 4½ inches from the center on the starboard side and the propeller is 3 inches off the center, the theory being that this will overcome the torque of the propeller wheel; that is, the heeling of the boat when under way caused by the twisting effect of the wheel in water. On her trial trip the boat was sent over a mile course which had been measured by Captain Joynes and Lieutenant Monroe of the U. S. Revenue Cutter Tahoma. Going up the river against the tide, she covered the distance in 1 minute and 38 seconds, or at a speed of something better than 40 miles per hour. Coming down with the tide she made exactly 45 miles an hour, covering the course in 1 minute and 20 seconds. It must be remembered that this was before the engine was thoroughly tuned up, and that on this occasion, it was turned over at only 1,300 r.p.m. When she is in real racing trim, she will probably prove one of the fastest 26-foot displacement boats in the water. The Wigwam II is owned by Chas. F. Wise.

Detroit to Have Water Carnival.

The city of Detroit, Mich., is planning a big water carnival to celebrate its 211th anniversary, which will be held during the week of July 22nd to 27th. The carnival has been named "Cadillaqua," after the French adventurer and explorer Cadillac, who founded the city in 1701. The water sports committee, headed by George W. Graves, of the Detroit Motor Boat Club, has extended a widespread invitation to motor boat, canoe and yacht clubs all over the country to participate in the races. The motor boat contests will start from the Detroit Motor Boat Club house and circle Belle Isle, and the sailing races will take place on Lake St. Clair. During the week of the carnival all of the local clubs will keep open house to the members and representatives of foreign organizations. Besides the races there will be a large river pageant depicting the arrival of Cadillac, another historical pageant in which water fleets will be employed and a naval parade for all the pleasure craft in Detroit waters. Information regarding the individual events may be obtained from George W. Graves, of Detroit.

Gray Adopts Useful Instruction Book.

The Gray Motor Company, Detroit, Mich., has adopted a handsome and valuable little 72-page book, entitled "The Gasoline Engine, Marine and Stationary, its Construction, Operation and Care," written by H. G. Diefendorf, as its instruction book. The book is lavishly illustrated with diagrams and sectional views showing the operation and construction of gasoline engines in great detail, including a very interesting and valuable series of wiring diagrams, and the text is at the same time concise, non-technical and yet sufficiently full and clear to insure the amateur against serious mistakes if he is wise enough to follow closely the directions and advice laid down. Quite a little space is given to the operation of the engine and in this section is found a very useful list of engine troubles tabulated for quick reference. The book is supplied free of charge with all Gray motors.

Old Motors for New.

Bruns, Kimball & Co., Inc., 132 Liberty Street, New York City, announce that they are making a specialty of exchanging marine motors—taking the old engine as part payment for the new one. The used machines are rebuilt and overhauled and sold at reasonable prices with a guarantee. The company has a list of these second-hand engines for anyone interested.

Mcrris M. Whitaker, N. A., who has recently moved his headquarters to Nyack, N. Y.

Morris M. Moves Up-Stream.

Morris M. Whitaker, a well-known naval architect of this city, who has made a specialty of motor boat designing, has moved his headquarters from the Metropolitan Tower, where he has been located since 1909, to his new home in Nyack, N. Y. As soon as he is well settled he intends to erect a building suitable for an office, with a drafting room which will accommodate six men, a blue print room, stenographer's room and private office. Mr. Whitaker comes of a family which has followed the sea for a number of generations. His father was a chief engineer in the navy, serving through the Civil War and up to 1895. When Mr. Whitaker graduated from Yale he began his career as a special apprentice with the Newport News Ship Building & Dry Dock Co., where he had a thorough training in the practical side of his profession. From here he went to Cornell for post-graduate work in naval architecture and leaving that university in the spring of 1898, went back to Newport News as draughtsman, after a brief period in the office of C. D. Mosher, who was working on some torpedo boats. While with Mosher he worked on the plans for C. R. Flint's Arrow and about a year after resuming work at Newport News, Mr. Flint sent for him to take charge of her construction at Nyack. This task completed, Mr. Whitaker went abroad and when he came back in 1900 he had decided to follow the star of motor boating, which was then just starting on its upward course. So, for five years, he built this type of craft in Canada, where he had organized a company, and then, the concern being forced out of business through lack of capital, he returned to New York, where he did some work for a trade journal, did designing for a firm of naval architects and was for a short time partner in another firm and at last, in 1909, hung out his shingle on the Metropolitan Tower. Mr. Whitaker has had an unusually wide experience in the motor boat field and his boats bear testimony to the good use he has made of it. He has also been identified with motor boat racing, both short and long-distance.

Eagle Offers Novel Racing Trophy.

The Motor Boat & Supply Co., Cleveland, O., agents for the Eagle Company of Newark, N. J., makers of Eagle marine motors, recently presented to the racing committee of the Inter-Lake Yachting Association a trophy for the regatta at Put-In-Bay, which is not only unique in itself, but will be raced for under conditions that are even more unusual. The trophy is a full-fledged 16-foot family type motor boat, powered with a 4½ h.p. 1912 model Eagle engine, both boat and engine furnished with full equipment and together making an outfit amounting in value to something around $300. Toward the end of the regatta week the boat will be run out into the lake to a point about two miles from the starting line, the wheel will be lashed down, the engine

A Matthews craft for Southern use. Note the large amount of deck space,

Thirty-foot Speedway runabout, built by the Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated, of Morris Heights, N. Y.

started and the craft turned loose at full speed without a single soul aboard. The boats entered in the contest will then be started according to handicaps based on their performance during the events of the preceding days and the lucky owner of the craft which first overtakes and captures the prize, will be its possessor as well as the winner of the race. Naturally such a novel contest has aroused all manner of speculation as to how the race will end. A number of rash speculators, with a passion for mathematics, have figured not only that the thrash of the propeller is going to send the boat to port, but the exact degree to which her course will be affected by this factor. Mr. Sutherland, of the Eagle Company, however, has not committed himself as to whether the engine will turn a right or left-hand propeller or at just what speed the boat will run. There is another class of speculators almost as interesting. That is the one made up of people who have devised schemes whereby the donors can live up to the full letter of their agreement and still retain possession of the boat. The racing committee, however, will have entire control of the boat and the conduct of the race.

Fiske Lubricants Have New Name.

The Fiske Bros. Refining Co., of New York, are calling attention to the fact that in the future their well-known line of motor lubricants, heretofore sold under the name of Climax Synovia cup grease, Phœnixo gear case lubricant and Centaur graphite grease is to be marketed in new, lithographed packages bearing the trade name "Lubroleine," under which name their high-grade motor oils are sold. The fourth edition of "The Mission of Lubroleine," describing these various lubricants, has recently been issued and will be sent free on request.

Sales Agency Incorporates.

The Eastern Marine Motor Sales Company was recently incorporated in New York with the following officers: Harold W. Brown, president; John J. Simpson, treasurer, and T. M. Fenner, secretary. The company represents Frisbie, Northwestern and Brown motors and the Sintz reversing propeller. The office is located at 136 Liberty Street, New York City, and the shops at the foot of Bay 44th Street, Ulmer Park. The company also builds and designs boats.

Loew Plant Expands.

The Loew Manufacturing Company, Cleveland, Ohio, has added about 200 square feet to its machine shop and assembling room space. This expansion was necessitated by the increasing demand for Loew Victor engines, which also compels the company to work almost its entire force over-time.

Death of Engine Manufacturer.

The Buffalo Gasoline Motor Company, of Buffalo, N. Y., have announced the death of their secretary and treasurer, Abraham Snyder, on Tuesday, March 12th.

An Old Hardware House.

The A. S. Morss Company, of Boston, Mass., can justly lay claim to being one of the oldest houses manufacturing and selling marine hardware in the business. They were established in 1844 and since that time have been offering an ever-increasing line of boat builders' supplies, motor boat fittings and ship and yacht supplies of the highest quality. Besides making a large assortment of hardware themselves, they carry the products of many of the well known manufacturers. The company's new catalogue is a book of nearly five hundred pages and will be of great interest to not only the owner but the prospective buyer of a motor boat.

A Special Runabout at a Special Price.

The Niagara Motor Boat Company, of North Tonawanda, N. Y., is offering a 24-foot runabout, equipped with a 12 h.p. four-cylinder, four-cycle motor at the rather remarkable price of $625. The price is remarkable when one considers what it can buy, for the boat has a copper-fastened hull with mahogany finish, reverse gear and rear starter, an automobile steering wheel on which the controls are located, polished brass deck fittings and has seating capacity for eight persons. This is only one of a large line of motor-driven craft built by the Niagara Company, including open family launches, runabouts, speed boats and cruisers ranging in size from the 18 ft. x 4 ft. 6 in. motor boat with a 3 h.p. engine up to the 42 ft. x 10 ft. 6 in. raised-deck cruiser driven by 24 h.p.

A big shipment of Auto Craft motor boats.

A Large Boat Shipment.

The Cleveland Auto Boat Manufacturing Company, of Cleveland, Ohio, recently shipped a carload of "Auto Craft" motor boats to their new distributers on the Pacific Coast, the Gas Power & Supply Company, Portland, Ore. This is only one of several car lots shipped this season. The policy of the Cleveland Auto Boat Company is to standardize on certain stock models in the smaller size for both pleasure and commercial uses, thus making it possible for people of moderate means to purchase a dependable outfit at a reasonable price. The standard power equipment used is the Ferro marine motor.

The Vanguard Open Base Engine.

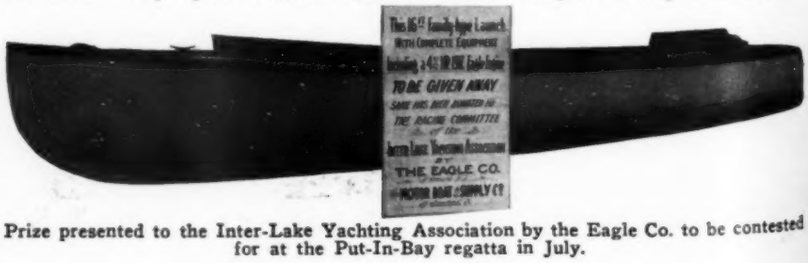
One feature of the Vanguard open base marine motor made by the Vanguard Engine Company, Boston, Mass., is its accessibility. With the exception of the pistons, all of the working parts are in sight and easily accessible and the makers claim that in ten minutes a two-cylinder Vanguard can be taken entirely apart. Flooding of the cylinders is eliminated by the method of handling the charge of gasoline from the carbureter in the primary compressing space. The ability of the engine to exhaust three feet under water without base explosions or retarding of its speed, does away with the necessity for a muffler. The cylinder construction is rather unique in this motor. The Vanguard is a two-cycle engine and instead of water-jacketing the whole length of the cylinder, a division is placed at the ports so that while the water circulates freely in the upper half of the cylinder and the head, the lower space between the cylinder walls is used as a mixing chamber, where the gasoline comes from the carbureter, is mixed, heated, expanded and vaporized, completing the carburetion, before being drawn into the cylinder. The makers claim that the Vanguard will show a great saving in fuel, will leave no odor at the exhaust, is reliable in start and control and does not lose its primary compression through leakage.

A Kerosene Gas Producer for Gasoline Engines.

Although a comparatively recent invention, the gas producer made by the Universal Oil Converter Company, of Long Island City, has proved to be both practical and successful commercially. The device can be attached to any marine gasoline engine of standard make without alteration and when once installed the engine can be run on either gasoline or kerosene as desired. The producer is cylindrical in shape, varying from 11½ to 26 inches in length and 5 to 8 inches in diameter. It is attached to the exhaust manifold and the kerosene is vaporized by passing through a specially designed mixing valve. The suction of the engine then draws this vapor through passages heated by the exhaust to a point at which the vapor becomes a gas and in this form it is delivered to the carbureter to be mixed with about four parts of air before entering the cylinder. The engine is started on gasoline which is shut off after running for about three minutes and the kerosene turned on automatically by means of a thermostat. The device has been adopted as part of the standard equipment by the Loew Mfg. Company, and other large contracts which the makers have show that it is by no means considered an experiment. The producer is handled by the Kerosene Gas Producer Company, 1926 Broadway, New York City.

Something for the Whistle Outfit.

The Yale Air Compressor, manufactured by the Baird & Henselwood Company, of Detroit, Mich., was designed to meet the demand for a high-grade, medium-priced compressor for charging air tanks under medium pressure to be used with whistle outfits. The design of the compressor makes an attractive and compact machine. The piston is long and has an air-



Prize presented to the Inter-Lake Yachting Association by the Eagle Co. to be contested for at the Put-In-Bay regatta in July.

tight compression ring to insure the maximum amount of pressure. Long bearings are provided and oilers are placed over each bearing besides the one on the cylinder and the oil chamber cast on the connecting rod. Every pump is tested to 175 pounds pressure and the safety-valve is set to blow off at 75 pounds. The compressor complete with oiler, pulley, etc., is listed to sell at $14.

The Lisk Line.

The Lisk marine gasoline engine is made by Geo. A. Lisk, of Detroit, Mich., and is built in sizes of 3½ and 5 h.p. with one cylinder, 10 h.p. with two, 15 h.p. with three, 20 h.p. with four and 30 h.p. with six cylinders. The 3½ h.p. size has a bore and stroke 4 x 5 inches, and all the larger sizes have a bore of 4⅝ inches and a stroke of 5 inches. Lisk motors are of the four-cycle type and were designed with a view to simplicity and ease of access to every part. The cylinders have solid heads with walls, exhaust and intake chambers thoroughly water-jacketed and mechanically-operated valves of large size, both located on one side. The crankcase is lubricated by the splash system with an oil-tight partition between each cylinder and extra sight-feed oilers are supplied. The engines are regularly supplied with ignition equipment, bronze stuffing box and end bearings, shafting, solid bronze propeller, etc., or, at an additional cost, with friction clutch or reverse gear.

An Interesting Stock Runabout.

The development of motor boating has brought with it a great advance both in the number and quality of the various makes of stock craft. A prominent example of this type is the 30-foot "Speedway" runabout, made by the Gas Engine & Power Company & Chas. L. Seabury & Company, Cons., of Morris Heights, New York City. This boat makes an ideal power craft for family use, since it is at the same time attractive in appearance, dry and seaworthy in rough water and has a speed of 14 to 15 miles an hour. The boat has a beam of 6 ft. and a draft of 2 ft. 2 in., and is equipped with a four-cylinder, four-cycle 18-22 h.p., 4½ x 5 in. "Speedway" engine with jump-spark ignition from magneto or dynamo, McCord force-feed oiling system, oil leveling device for the base of the motor, Tobin bronze propeller shaft, bronze propeller wheel, strut and stern bearing, power whistle outfit, etc. The spark and throttle controls are placed on the steering wheel, which is located on the bulkhead within easy reach of the reverse lever so that the entire crew need consist of but one person. The hull is cedar planked on oak frames and the decks, coaming and interior trim are of selected mahogany. The list price is $2,650, and the boat is also built in a 25-foot length at $2,250, and a 25-foot length at $1,800.

A Triple-Screw Motor Yacht.

One of the handsomest motor yachts in the East is the 110-foot Elemasada II, recently built at the yards of Whittelsey & Whittelsey in New York for Daniel Good, of Buffalo. The vessel is designed for service at sea or on the Great Lakes and her initial trip in June will be a run of 1,800 miles from New York City to Buffalo via Halifax and the St. Lawrence River. The Elemasada II is a triple-screw boat powered with three 120 h.p. Sterling heavy-duty engines, designed to give her a speed of 18 miles per hour or better. The three big machines were given a three-day non-stop test under the supervision of H. Newton Whittelsey who approved the reports of the tests by his signature before they were turned over to the owner. These tests showed the horsepower developed by each machine at different speeds and the slight variation shown was quite remarkable when the large size of engines is considered.

Seminole, owned by W. H. Snyder, of Oak Hill, Fla. She has a 40-h.p. Buffalo engine and was among the principal performers at St. Augustine.

Twenty-five Miles an Hour for $1,000.

The Eldredge-Whitaker hydroplane is a production of Morris M. Whitaker, a well-known specialist in motor boat design and is an excellent little craft for either racing or use as a runabout or yacht tender. The offer of a twenty-foot hydroplane with a guaranteed speed of 25 miles an hour for $1,000 should certainly be attractive enough to interest those of the boating fraternity who like to get over the water in a hurry. The craft is built with oak frames, clear cedar planking, pine or spruce deck and coamings and mouldings of mahogany. She has a turtle-back deck and her motor under the hood, all controls at the steering wheel and seating capacity for four persons. The engine is a Pierce-Budd racing motor, built throughout of nickel steel and having a great range of control. When running at full speed the boat lifts from the water bodily and, due to her considerable flare forward, is exceptionally dry. These craft are handled by Albert E. Eldredge, 30 Church Street, New York City.

Modern plant of the Columbian Brass Foundry, Freeport, L. I.

Elemasada II, a 110-foot triple-screw steel cruiser, built by Whittelsey & Whittelsey for Daniel Good of Buffalo and equipped with three 120-horse heavy-duty Sterling engines. Drawing by G. A. Coffin.

New Ferro Distributors.

The Motor Boat & Auto Supply Company, 311 Main Street, Cincinnati, Ohio, has been appointed distributer for the Ferro engine in all counties bordering on the Ohio River in the states of Ohio, West Virginia, Kentucky, Indiana and Illinois. The Marine Equipment & Supply Company, 55 West 7th Street, Philadelphia, Pa., will distribute Ferro engines in Bucks, Montgomery, Chester, Delaware and Philadelphia counties in Pennsylvania; in Burlington, Camden, Gloucester, Salem, Cumberland, Cape May and Atlantic counties in New Jersey, and in the entire state of Delaware.

New Plant of the Columbian Brass Foundry.

The growth of the Columbian Brass Foundry is well exemplified in the new plant on the main street of Freeport, L. I., into which the company has just recently moved. The building is one story high, of modern brick factory construction, 220 x 64 feet, and is equipped with every facility for the production of bronze propeller wheels and accessories. The office occupies the front of the building, with a fireproof vault, dictating room for phonograph dictation, telephone booth, etc., adjoining. In the rear of the office is the stock room and next to this is located the packing and shipping department. The foundry is a room 60 x 54 feet, containing a coke-tilting furnace for melting the metal which has a capacity of 2,700 lbs. of raw material per day, and a battery of pit furnaces which brings the total melting capacity of the foundry up to 6,000 lbs. per day. A room measuring 39 x 46 feet adjoins the foundry and here the large collection of propeller designs is stored. The propeller wheels leave the foundry as rough castings. The next step is the sawing off of the gates and fins in the chipping and cleaning room, whence the wheels are taken to the polishing room where the accurate lines of the faces and edges so important in a speed propeller, are brought out by expert polishers. In the machine shop, the wheel is bored for the shaft if so ordered, and the faces of the hubs machined off true. The stamping of the diameter and pitch and right or left-hand, completes the work and the wheel is then ready to take its place among its many brethren.

The Anderson Engine Advertisement.

In February MoToR BoatinG the advertisement of the Anderson Engine Co., of Chicago, Ill., which appeared on the inside of the back cover had a slight error in the sentence reading, "During this our dull season we are *expecting* a number of special orders at reduced prices." This sentence should read, "During this our dull season we are *executing* a number of special orders at reduced prices." We endeavored to make a note of this correction in the April issue, but through some unfortunate slip, the correction notice itself was wrongly worded.

Eagle Enters Chicago.

The Eagle Company, of Newark, N. J., has established a new distributing agency with Robt. H. Richter, 527 West Jackson Boulevard, Chicago, Ill. A large line of engines and repair parts will be kept in stock.

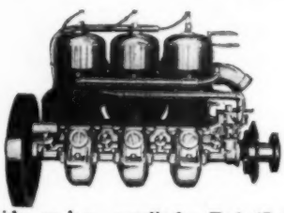
A Story of Growth.

The Lackawanna Manufacturing Company, maker of the Lackawanna valveless reversible marine motors, was one of the early comers in the marine engine field. For a number of years the company shared a large plant at Newburgh, New York, with the Coldwell Lawn Mower Company, but the rapid increase of the business of both companies necessitated the renting of outside space to provide adequate manufacturing facilities and finally the Lackawanna directors decided to seek new and larger quarters. These were found in the large foundry and machine plant of the Davison-Namack Foundry Company, of Ballston Spa, New York, and a consolidation was effected by R. H. Davison, president, and William H. Namack, vice-president of the foundry concern, joining the Lackawanna staff as treasurer, and vice-president and secretary respectively; F. G. Hall, of the Lackawanna, being re-elected president and general sales manager. The new plant has about 40 acres of land on which there is a complete steel and iron foundry with excellent railroad facilities and, with the moving of the Lackawanna plant to this location and the making of up-to-date improvements, the manufacture of the marine motors and also a complete line of electric light and stationary motors is well taken care of. The New York office of the company will continue at 124-6 Liberty Street.

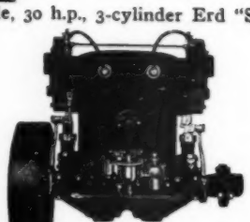
New home of the Lackawanna Mfg. Co., at Ballston Spa, N. Y.

Erd Marine Motors.

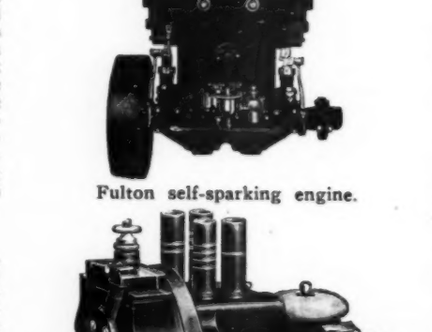
The Erd Motor Company, of Saginaw, Mich., are manufacturing marine motors of three distinct types; a four-cycle, heavy-duty type for work boats and cabin cruisers in sizes of from 12 to 80 h.p., a two-cycle type for family launches and fast runabouts in sizes of from 3 to 60 h.p., and a special two-cycle, light-weight racing motor in from 20 to 60 h.p. sizes. Early in the season of 1911 the company placed on the market the Erd Special "Featherweight" high-speed two-cycle engine, ranging in size from 2 up to 6 cylinders and from 20 to 60 h.p. In designing this motor the company went to work with the intention of turning out something original—something that would be reliable under the hardest and most severe conditions. To gain this end, J. G. Erd, the president and designer of the company, spent two years in working over the designs of the Erd Special and tested it out in every possible way. For this engine the Bosch magneto dual ignition system was selected, and a new automatic advance and retard for the magneto armature was designed, giving 30 degrees advance automatically and an additional breaker box advance of 35 degrees on magneto.



Port side, 30 h.p., 3-cylinder Erd "Special."



Fulton self-sparking engine.



Type BH 4 Mea magneto.

The Mea Magneto.

The Mea magneto is built in Stuttgart, Germany, in a number of different models for one, two, four, six and eight-cylinder motors of all sizes, for either independent or dual ignition. A radical departure in magneto design is found in the bell-shaped magnet, so placed that its own axis coincides with that of the armature. By advancing and retarding this magnet jointly with the timing device, the spark is produced always at the most advantageous point and is therefore of the same heat value, independent of the timing. The construction of the Mea magneto has permitted a considerable reduction in weight and extreme compactness. Other details worthy of attention are the practically waterproof design of the instrument and a small transparent window located in the face plate, behind which figures appear indicating the number of the cylinder fired at any time. The Mea is represented in America by Marburg Brothers, 1777 Broadway, New York City.

The Fulton Self-Sparking Engine.

Two years ago the Fulton Manufacturing Company, of Erie, Pa., began manufacturing their self-sparking marine engines and the success of these machines has been so great that the company has now entirely abandoned the old model jump-spark and make-and-break motors and is building for 1912 the self-sparkers exclusively. The ignition system is mounted complete on the engine, is entirely waterproof and does away with all troublesome coils, batteries, timers, vibrators and other exasperating features found on the majority of marine motors. While the ignition system has had a good deal to do with the excellent results obtained from Fulton engines in oyster boats, fishing boats and commercial craft of all kinds, their construction has also played an important part in increasing their popularity. The two-cylinder engines are equipped with an automatic bilge pump and the entire line has force-feed mechanical oilers, reverse gears and extension sub-bases.

(*Continued on page 71.*)

CALENDAR

May 29. Capital Yacht Club, Washington, D. C. Cruising race, Washington to Annapolis, Md.

May 30. Hudson River Yacht Racing Association. Relay race, New York to Albany, carrying a message from Mayor Gaynor to Gov. Dix. Fastest boat in each of the 12 clubs to carry the message for one leg of about 15 miles.

June 22. Colonial Yacht Club, New York. Cruiser race from the club house, 140th St. and North River, to Corn Field Pt. light vessel and return, 138 nautical miles, A. P. B. A. rules. Address the Regatta Committee.

June 22 and 23. Tappan Zee Yacht Club, Grand View-on-Hudson, N. Y. Race for cabin cruisers up to 45 feet, Grand View to Kingston and return, for the Disbrow cup.

June 24. Delaware River Yacht Racing Association. Cruiser race for championship of the Delaware river, from the Keystone Yacht Club, Philadelphia, Pa., to Overfalls light and return.

June 28 and 29. Cambridge Yacht Club, Cambridge, Md., Regatta.

June 29. Maryland Motor Boat Club, Baltimore, Md. Open handicap 200-mile race from Ferry Bar to Pt. No Point and return. Three classes, 40 and over. A. P. B. A. rules. Address W. F. Tanner, Secretary of the Racing Board, 329 No. Calvert St., Baltimore.

June 29. Ocean City Motor Boat Club, Ocean City, N. J. Regatta.

July 4, 5 and 6. Mississippi Valley Power Boat Association. Regatta at Davenport, Ia.

Week of July 14. Inter-Lake Yachting Association. Regatta at Put-in-Bay, O.

July 22 to 27. Cadillaqua. Water carnival. Detroit, Mich.

August 7. Finish of the **Scripps Reliability Cruise** at Hamilton, Ont.

August 8, 9 and 10. Great Lakes Power Boat League, third annual regatta at Hamilton, Ont., under the auspices of the Royal Hamilton Yacht Club.

August 14. Camden Motor Boat Club, Camden, N. J. Races.

August 21. Keystone Yacht Club, Philadelphia, Pa. Cruiser race, Wilmington, Del., to Ship John light and return.

August 31 and September 2. British International Trophy Races.

MOTOR BOATING ADVERTISING INDEX

Aaron Automatic Bilge Pump Co. .103
American Engine Co. 107
American Steam Gauge & Valve Co. 95
American Thermos Bottle Co. 82
Amnelius, Theodore. 82
Anderson Engine Co. 3d Cover
Aquaplane Co. 82
Atlantic Co. 95
Atwater-Kent Mfg. Works. 82
Auto Safety Crank Co. 72
Auto Specialties Mfg. Co. 78
Automatic Bilge Bailer Co. 88
Automatic Machine Co. 111

Baldridge Gear Co., The. 76
Banner Engine Sales Co. 84
Bantam Anti-Friction Co. 82
Barber Bros. 102
Bath Marine Construction Co. 140
Battershall, F. W. & Co. 110
Bayonne Casting Co. 121
Bayonne Launch Co. 84
Belle Isle Motors. 80
Biddle Hardware Co. 82
Binney, Arthur. 71
Boston Varnish Co. 101
Bottger Bros. 82
Boucher Mfg. Co., H. E. 82
Bowes & Moyer. 71
Breese & Breese. 71
Breeze Carbureter Co. 96
Bridgeport Bronze Marine Paint Co. 82
Bridgeport Motor Co. 103
Brooks Mfg. Co. 84
Brown-Collins Gas Engine Co. 84
Brown Gas Engine Co., B. F. 107
Bruns, Kimball & Co., Inc. 63-69-71
Bryant & Berry Co. 89
Buffalo Gasolene Motor Co. 144

Caille Perfection Motor Co. 123
Camden Anchor-Rockland Mach. Co. 107
Campbell Co., A. S. 82
Campbell Motor Co. 118
Cape Cod Power Dory Co. 88
Carlisle & Finch Co. 95
Carlyle Johnson Mach. Co., The. 101
Carpenter & Co., Geo. B. 125
Chase, L. C. & Co. 82
Chelsea Clock Co. 82
Classified Advertisements. 68-69-70
Cleveland Auto Boat Mfg. Co. 105
Coleman Liquid Copper Co. 84
Columbia Engine Co. 82
Columbian Brass Foundry. 117
Concrete Form & Engine Co. 80
Connecticut Tel. & Elec. Co. 109
Cosmopolitan 80-114
Cox & Stevens 54-64-71
Craig, James. 71
Crockett, David B. 91
Curtiss Co., J. H. 137

Dale, Wm. L. 101
Dawson Boat Co. 76
Dayton Electrical Mfg. Co. 87
Dean Mfg. Co. 106
Defoe Boat & Motor Works. 95
DeLong Engine Co. 106
Detroit Boat Co. 76
Detroit Coil Co. 72
Detroit Engine Works. 84
Detroit Lubricator Co. 109
Detroit Motor Car Supply Co. 82
Diem, Gus A. 95
Dietz Co., R. E. 69
Doman Co., H. C. 75
Downey Shipyard & Marine Co. 71
Doyle Co., The M. I. 84
DuBrie Motor Co. 84
Durkee & Co., C. D. 106

Eagle Co., The. 142
Eastern Marine Motor Sales Co. 71
Edison, Inc., Thomas A. 111
Elbridge Engine Co. 84
Elco (The Electric Launch Co.) 2d Cover
Electric Goods Mfg. Co. 131
Emerson Engine Co. 136
Erd Motor Co. 104
Erie Specialty Co. 104
Estabrook, C. W. 66
Evans Stamping & Plating Co. 76
Evinrude Motor Co. 106

Fahnestock Electric Co. 72
Fairbanks, Morse & Co. 85
Fairhaven Iron Foundry Co. 95
Fauber, W. H. 113
Ferdinand & Co., L. W. 76
Ferro Machinery & Foundry Co. 139
Fiske Bros., Refining Co. 79
Fogg, M. W. 76
Frazer Bros. 82
Frisbie Motor Co. 95
Fulton Mfg. Co. 107

Gardner, William. 56
Gas Engine & Power Co. and Chas L. Seabury Co., Consolidated. 115
Gasoline Engine Eq. Co. 84
General Electric Co. 84
Gielow & Orr. 57-65-71
Gies Gear Co. 93
Gile Boat & Engine Co. 91
Gillespie, Chas. H. & Sons. 85
Gilmore-Cragg Motor Mfg. Co. 119
Globe Gas Light Co. 80
Goblet-Dolan Co. 84
Goshen Motor Works. 80
Grand Rapids Gas Engine Co. 78
Gray Motor Co. 128
Grimm Mfg. Co. 104
Grossman Co., Emil. 78

Hall Gas Engine Co. 72
Hall Gas Engine Mfg. Co. 76
Hall-Gibson Co. 75
Hand, John E. & Sons Co. 95
Hand, Wm. H., Jr. 71
Hardy Co., R. E. 72
Hatch Oil Engine Co. 72
Hazard Motor Mfg. Co. 101
Henke Mfg. Co. 143
Henricks Novelty Co. 92
Herbert & Huesgen. 72
Hettinger Engine Co. 83
Hickok Mfg. Co. 86
Holmes Motor Co. 105
Homer, A. P. 71
Hopkins & Co., John C. 83
Hudson Yacht & Boat Co. 76
Hunter Baltimore Rye. 75
Hyde Windlass Co. 100

Insurance Co. of North America. 90

Janney, Steinmetz & Co. 72
Jencick Motor Co. 112
Jennings Yacht Agency. 61
Jewel Electric Co. 108
Jones, Frank Bowne. 59
Jones, S. M., Co. 77
Jones Sailmaking Co. 72
Jordan Bros. Lumber Co. 78

Kahlenberg Bros. 75
Kennebec Motor Canoe Co. 76
Kennedy Machine Co. 115
Kenyon Co., R. L. 85
Kerosene Gas Producer Co. 112
Koven, L. O. & Bro. 82
Krice Carburetor Co. 94
Krogman & Purdy. 67-71
Kuhls, H. B. Fred. 94
K-W Ignition Co. 87

Lackawanna Mfg. Co. 100
Lamb Boat & Engine Co. 144
Lawley, Geo. & Son, Corp. 88
Lee, Robert T. 69
Lincoln Electric Co. 80
Lisk, Geo. A. 80
Lobee Pump & Machinery Co. 82
Lockwood-Ash Motor Co. 119
Loew Victor Mfg. Co., The. 133
Lombard Mfg. Co. 81

McClellan Top & Hood Co. 90
McIntosh, A. J. 60
Marburg Bros., Inc. 78
Marine Compass Co. 82
Marine Hardware Co. 74
Marine Producer Gas Power Co. 80
Mathis Yacht Building Co. 98
Matthews Boat Co., The. 3d Cover
Mechanical Devices Co., Inc. 97
Mechanics Fdry. & Mach. Co. 97
Mercury Motor Co. 116
Michigan Steel Boat Co. 78
Michigan Wheel Co. 124
Miller Bros. 80
Miller, Chas. E. 94
Miller, George H. & Co. 71
Miller, Wm. W. 71
Milton Boat Works. 82
Milwaukee Yacht & Boat Co. 97
Monarch Valve Co. 108
Monitor Boat & Engine Co. 86
Morgan Mfg. Co. 94
Morris, B. N. 86
Morss Co. A. S. 88
Morton Motor Co. 88
Motor 120
Motor Boat (London) 118
Motor Boat & Supply Co. 84
Motsinger Device Mfg. Co. 94
Mullins, W. H., Co. 99
Murray & Tregurtha. 90
Narragansett Chemical Co. 78
Naval Architects & Yacht Brokers. 71
New Departure Mfg. Co. 78
New York Gear Works. 96
New York Motor Works, Inc. 98
New York Yacht, Launch & Eng. Co. 96
Niagara Gasoline Motor Co. 78
Niagara Motor Boat Co. 114
Nichols & Wright Motor Co. 90
Noank Boat Co. 86
Nock, Fred S. 71
Northwestern Steel & Iron Works. 129
Novelty Mfg. Co. 78
Noyes Machine Co. 76
Oakes & Dow Co. 100
Outing Publishing Co. 76

Packard Electric Co. 94
Page Engineering Co. 90
Palmer Bros. 97
Petro Mfg. Co. 76
Philadelphia Gear Works. 84
Pinkham & Smith Co. 94
Pneumatic Mfg. Co. 74
Pyrene Mfg. Co. 113

Racine Boat Co. (Racine). 74
Racine-Truscott-Shell Lake Boat Co. 127
Regal Gasoline Engine Co. 77
Reliance Motor Boat Co. 62-124
Rex Motor Co. 99
Reynolds Motor Co. 141
Rice Bros. Co. 74
Richardson Eng. & Mfg. Co. 80
Richardson, G. R. 86
Rippley Steel Boat Co. 74
Robbins Co., L. D. 99
Roberts Motor Co. 130
Robertson Bros. 86
Robertson, J. R. 86
Rochester Gas Engine Co. 98
Roper & Co., C. F. 81-93-122
Rose Mfg. Co. 99
Rosen Co., A. W. 78
Royal Engine Co. 74
Ruddock (W. F.) Boat & Yacht Works. 71

S. R. Mfg. Co. 98
Sammet, G. W. & Son Co. 83
Samson Cordage Works. 98
Sands & Sons Co., A. B. 130-134
Schug Electric Mfg. Co. 78
Scripps Motor Co. 110
Seaman, Stanley M. 55
Shadegg Boat & Engine Co. 94
Shaw Propeller Co. 89
Smith & Co., Edward. 72
Snow & Petrelli Mfg. Co. 83
Splitdorf, C. F. 96
Standard Gear Co. 126
Standard Motor Construction Co. 2d Cover
Stanley Co. 80
Staten Island Shipbuilding Co. 117
Stearns, McKay & Co. 98
Sterling Engine Co. 117-Back Cover
Stickler Weedless Wheel Co. 90
Stott-Crowley Co. 82
Sturdy Mfg. Co. 76
Sturtevant Co., B. F. 85
Superior Machine & Engineering Co. 78

Tams, Lemoine & Crane. 58-117
Termaat & Monahan Co. 87
Thelma Motor Works. 80
Thermex Silencer Works. 74
Thomas & Co., W. E. 74
Tiebout, W. & J. 74
Toppan Boat Co. 86
Torrey Roller Bushing Works. 122
Trebert, H. L. F. 102
Trimount Rotary Power Co. 104
Trout Co., H. G. 82
Truscott Boat & Auto Supply Co. 96
Tucker & Carter Rope Co. 116
Tuttle Motor Co. 120

United Boat Co. 71
Universal Machine Co. 92
Universal Motor Boat Supply Co. 89

Valentine & Co. 73
Van Blerck Motor Co. 80
Vanderherchen's Sons, F. 96
Vanguard Engine Co. 80
Victor Marine Engine Co. 114
Vim Motor Co. 91
Viper Co., Ltd. 91

W & K Motor Co. 80
Waltham Watch Co. 138
Waterman Marine Motor Co. 102
Watts, J. Murray. 71
Weckler Boat Co. 132
Welin Davit & Lane & DeGrott Co. 108
Wells, Theodore D. 71
Western Launch & Engine Works. 87-92
Whitaker, Morris M. 71
White & Co, E. M. 96
Whittelsey & Whittelsey. 71
Wicker-Kraft Co. 96
Wilcox, Crittenden Co., Inc. 92
Willis Co., E. J. 89
Wilmarth & Morman. 74
Wilpen Co., The. 108
Wisconsin Mach. & Mfg. Co. 102
Wolverine Lubricants Co. 135
Wolverine Motor Works. 88
Wonder Mfg. Co. 80
Wordingham, W. G. 100
World Today. 86
Wright Engine Co., C. T. 108

Xargil Mfg. Co. 88

Yankee Co., The. 78
Youngs, Wm. P. & Bros. 82

Zarak Mfg. Co. 82

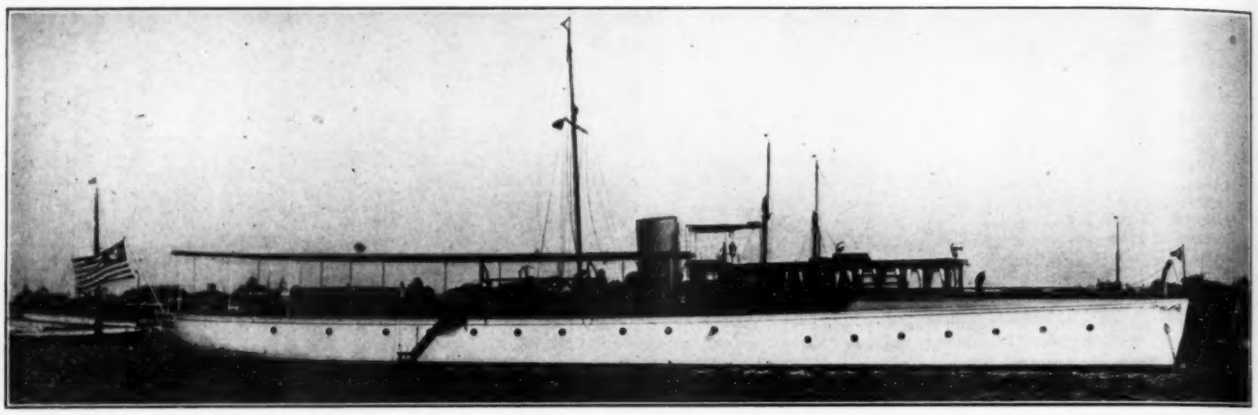
COX & STEVENS

NAVAL ARCHITECTS AND YACHT BROKERS

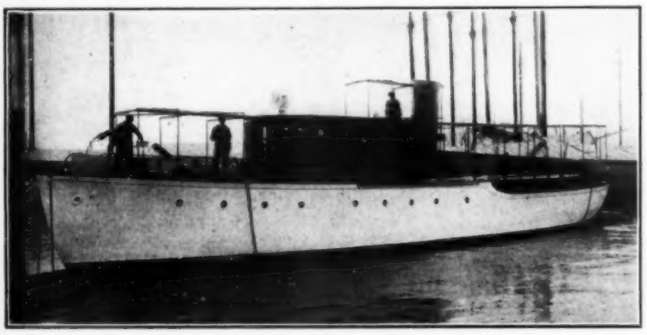
Telephone
1375 Broad

15 William Street
New York City

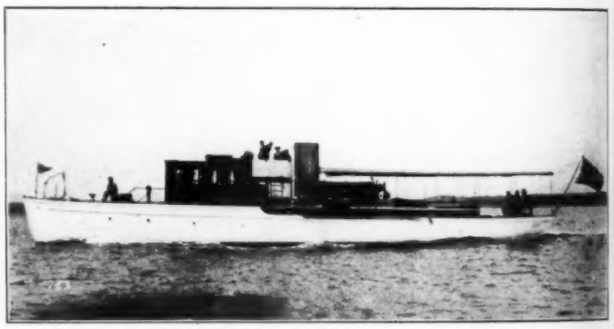
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars mailed on request.



No. 885.—For Sale or Charter,—Exceptionally handsome, fast, steel, twin screw cruising power yacht; 118 x 16.6 x 5 ft. Built 1910, from our design. Speed up to 18 miles; two 300 H. P. Craig motors, three double staterooms, main and dining saloons, two bathrooms, electric lights, etc.; handsomely finished and furnished. Probably the most desirable proposition ever offered in a large gasoline yacht. Apply to Cox & Stevens, 15 William St., New York.



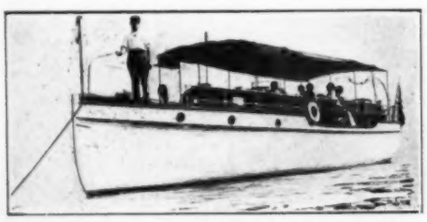
No. 961.—For Sale.—Very able and roomy, 90 x 17 x 4 ft., twin screw power yacht. Built by Lawley from our designs. Speed 12-13 miles. Three double and one single stateroom, bath, hot water heating system; all conveniences. Price low. Cox & Stevens, 15 William Street, New York.



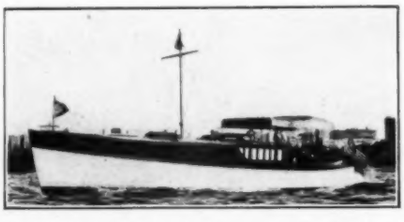
No. 464.—Excellent Bargain.—81 x 13 ft. power yacht; Lawley build. Speed 13-14 miles; 100 H. P. Standard. Two double staterooms, dining and main saloons, etc. Cox & Stevens, 15 William St., New York.

No. 1532.—For Sale.—Practically new 75 x 13.6 ft. twin screw cruising power yacht. Speed 12-14 miles. Three staterooms, bath, dining saloon fwd., etc. Best of type and size available. Cox & Stevens, 15 William St., New York.

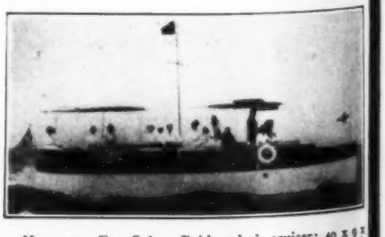
No. 1387.—For Sale.—Latest type twin screw power yacht; 65 x 11.6 x 4.3 ft. Built 1911 from our designs in best manner. Speed 13-14 miles; two 35-45 H. P. 20th Century motors. Dining saloon and galley forward: two double and one single staterooms, bath, etc., aft. Handsomely finished and furnished. Price very attractive. Cox & Stevens, 15 William Street, New York.



No. 668.—Exceptional Bargain.—50 ft. bridge deck cruiser. Speed 11 miles; 25-35 H. P. Standard. Two staterooms, saloon, bath, etc. In commission. Cox & Stevens, 15 William St., New York.



No. 1525.—Bargain.—Handsome 47 x 10.6 ft. power cruiser; built 1910. Speed 10 miles. Double stateroom, saloon, toilet room, etc. Mahogany finish throughout (including planking). Owner building larger. Cox & Stevens, 15 William St., New York.



No. 505.—For Sale.—Bridge deck cruiser; 40 x 9 x 3 ft. Speed 10 miles. Double stateroom, saloon, toilet and galley aft; engine room and crew's quarters forward. Mahogany finish throughout. Cox & Stevens, 15 William St., New York.

STANLEY M. SEAMAN

TELEPHONES, 3479 3171 CORTLANDT

YACHT BROKER

(ESTABLISHED 1900)

CABLE, "HUNTSEA" N. Y.

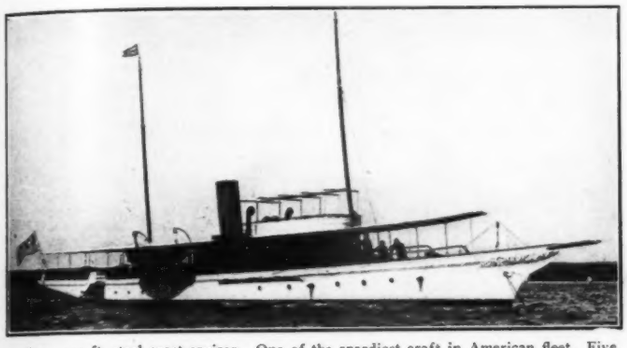
220 BROADWAY. NEW YORK

BRITISH CORRESPONDENT

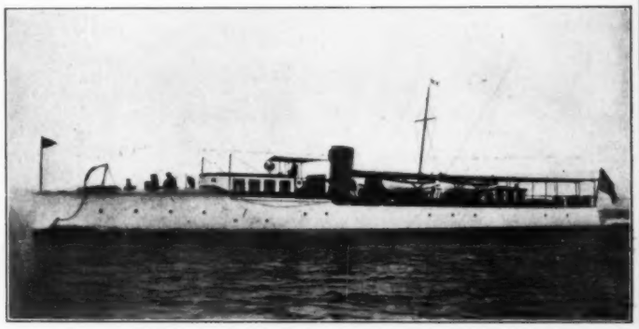
Yachts listed for sale free

MARINE INSURANCE

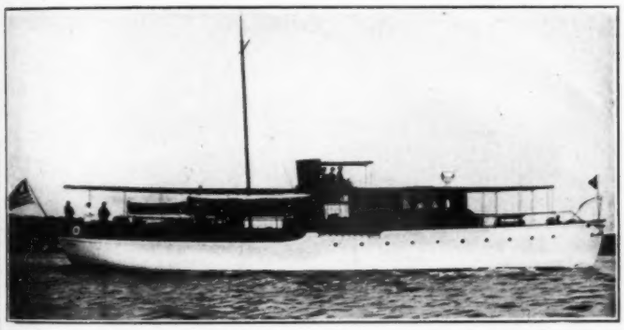
MY NEW ILLUSTRATED YACHT LIST SHOWS YOU AT A GLANCE *ALL* THE BEST YACHTS FOR SALE AND CHARTER WITH DESCRIPTIONS AND PRICES 80 PAGES. 200 PICTURES. *NOTHING SIMILAR PUBLISHED.* SENT GRATIS.



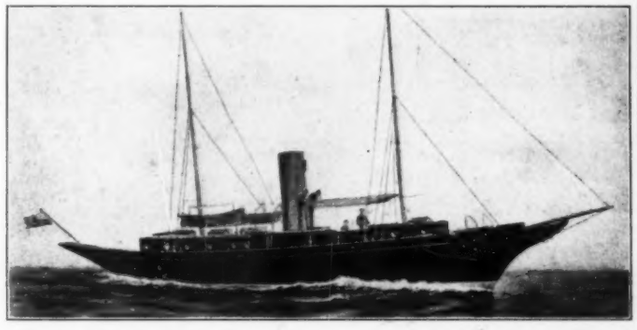
2697.—143 ft. steel coast cruiser. One of the speediest craft in American fleet. Five staterooms. Deck dining saloon. Three toilets. Speed, 16 miles. Has record 20.5 miles. Over $25,000 recently spent for permanencies. Practically new boat. First class 80 to 100 feet steam or power yacht accepted part payment. Want offer.



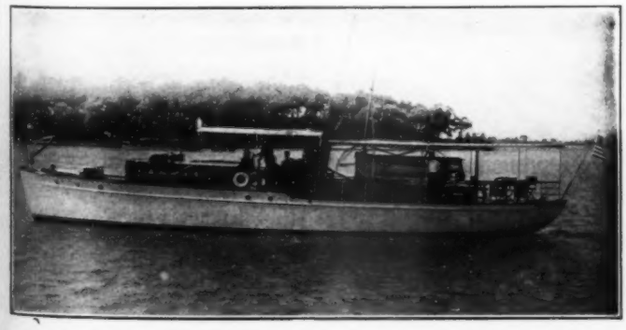
5471. Sale or Charter. 135 ft. Steel Steam Express Cruiser. 4 staterooms. 2 baths. Exceptional sea qualities. All modern conveniences. Elegant appointments. Speed 17 knots.



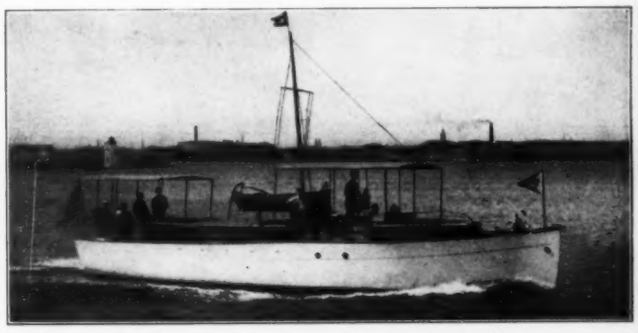
6856.—Twin Screw 90 ft. Seagoing Lawley Cruiser. Launched, 1909. Four staterooms, berths 6, bath, 2 toilets. Two 60 Craigs. Speed 12 miles. Electric lights and heat. 4 tenders in davits. Ideal American gentleman's yacht. Elegant appointments. Good as new. Reasonable price. Stanley M. Seaman.



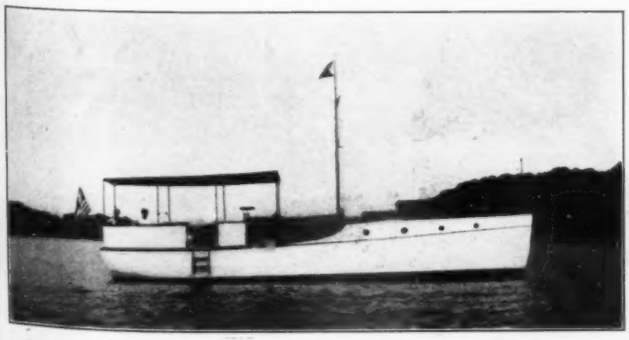
5417.—Coast Cruiser; Hull For Sale. 72 x 14.2 x 4. Built 1906 by Bayles from Wintringham's design. Hardly used. 2 staterooms and saloon; berth 6. Bath. Space for two 6-cylinder engines. Designed for offshore cruising, with abundant storage room. Unusually able. Well equipped. Price $6,000. Submit any offer. Grand opportunity for anyone desiring craft of this character. Inspectable near New York.



6855.—Latest Type Coast Cruiser. 66½ x 13 x 4. 2 staterooms and saloon, berth 6. All mahogany finish. Electric lights, bath, 2 toilets. 40-50 Standard. Speed 11½ miles. Deck control. Elegant cruising inventory. Low price. Stanley M. Seaman.



6902.—51 ft. 1910 Cruiser. Stateroom and saloon; berth 6. 2 toilets. 40 Sterling. Speed 10 miles. Acetylene light. Complete. Asking $5,500.



6911.—40 ft. 1911 Elco Cruiser. Berths 6. 16-20 Standard. Speed 10 miles. Electric lights. Complete. Headroom 6 ft. 2 in. Price $3,500.

6921.—Able 38 ft. single handed Cruiser. Built 1910. 4 berths. Headroom 6 ft. 2 in. 22 heavy Buffalo; speed 9½ miles. Acetylene light. Asking $2,500.

Careful inspections made of all boats before sold.

WILLIAM GARDNER

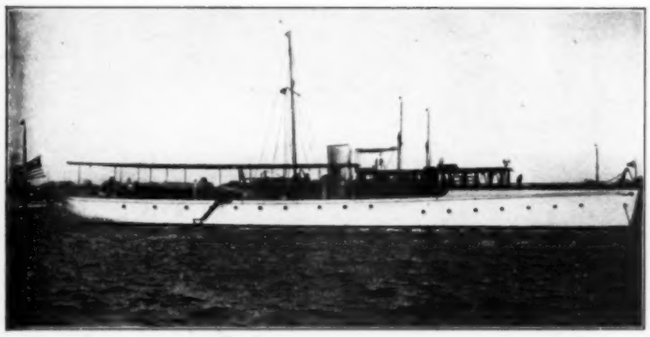
Large list of all the desirable Yachts for sale and charter.

YACHT BROKER, NAVAL ARCHITECT AND ENGINEER

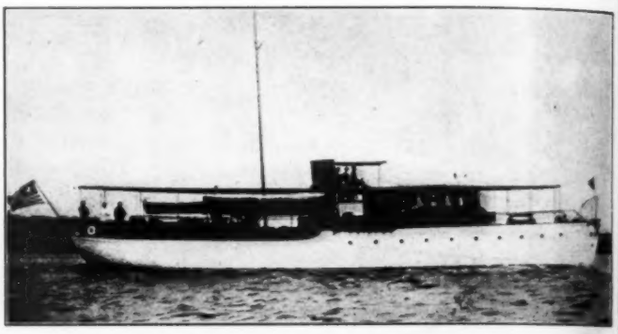
Telephone 3585 Rector

Kindly advise your requirements and complete details will be gladly furnished

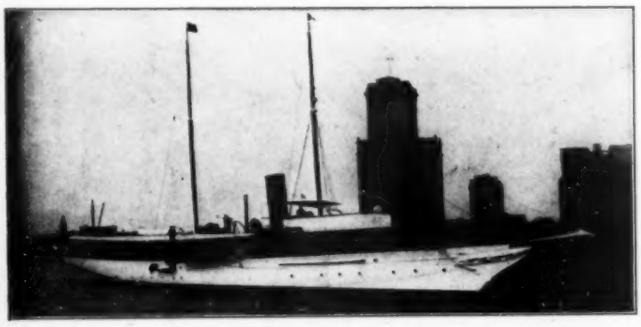
No. 1 Broadway New York



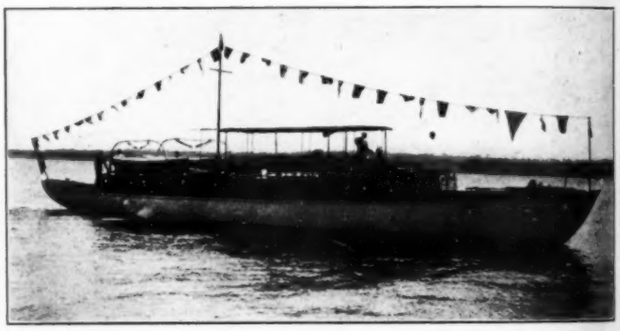
No. 1553.—Fast, 118 ft., steel, twin-screw power yacht; exceptional accommodation; speed 18 miles. Charter entertained.
Please mention MOTOR BOATING.



No. 1483.—Ideal 90 x 17 ft., twin screw cruiser; 4 staterooms, large deck dining saloon; two 60 Craig motors. Inspection invited.
Please mention MOTOR BOATING.

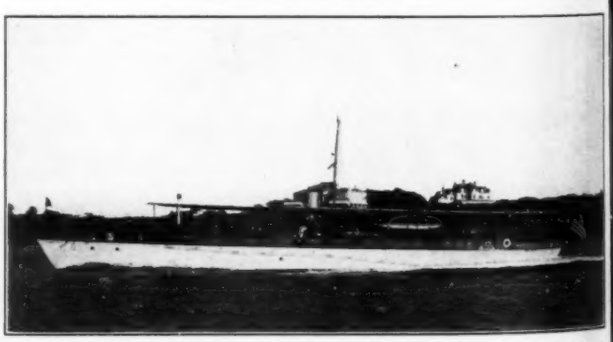


No. 170.—Sale or charter. Modern steel steam yacht, 150 x 18 ft.; excellent accommodation; A-1 condition.
Please mention MOTOR BOATING.



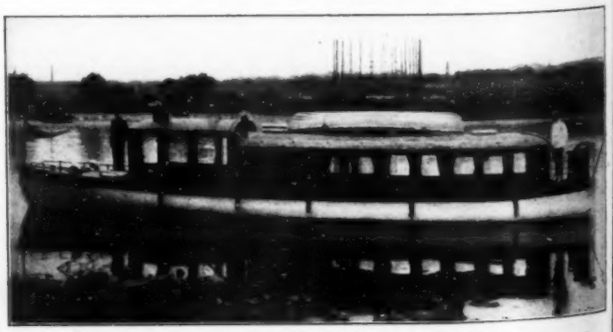
No. 1354.—Able and roomy 93 ft. twin-screw launch; two 60-75 H. P. Craig engines. Low figure.
Please mention MOTOR BOATING.

No. 1506.—Steamer type, 73 x 14; recent build; good sea boat.
Please mention MOTOR BOATING.



No. 948.—Fast, twin screw, 90 ft. cruiser; Craig engines; recently built from my design. Bargain figure.
Please mention MOTOR BOATING.

No. 989.—Mahogany cruiser, 42 x 9.6 ft.; sleeps four besides man; 24 h.p. motor. Located on Great Lakes.
Please mention MOTOR BOATING.



No. 1793.—Glass cabin cruiser; located on Mississippi River. 48 ft. long; draught 36 inches; motor 50 h.p.
Please mention MOTOR BOATING.

NAVAL ARCHITECTS
ENGINEERS
BROKERS
MARINE INSURANCE

GIELOW & ORR

52 Broadway, New York

Telephones { 4673 / 4674 } Broad

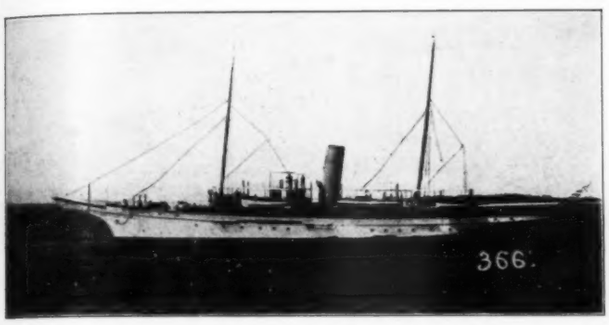
Cable Address:
Crogie, New York
A. B. C. Code

We have probably the largest list of American and European Yachts of all types for sale, charter or exchange, of any marine brokers. We give special attention to this department so that our information on each boat is always the most complete and up-to-date available.

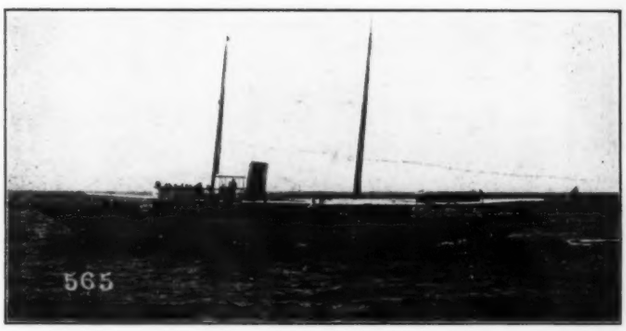
As there are upwards of 3,000 yachts in our list we can furnish you with exactly what you want, whatever the type, size, cost, equipment or class of service you have in mind. We publish no book of these because our list is so large and constantly changing but we will promptly submit photographs and full information on all suitable boats on the market, if you mention your requirements.

Our long experience as architects and engineers lends an added value to our brokerage service, in expert appraisal and advice, estimates and supervision on alterations, etc.

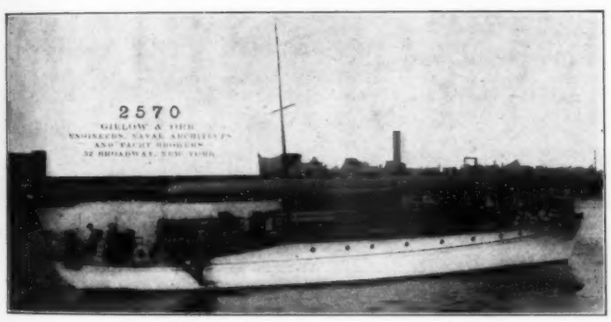
Write us to-day mentioning your requirements.



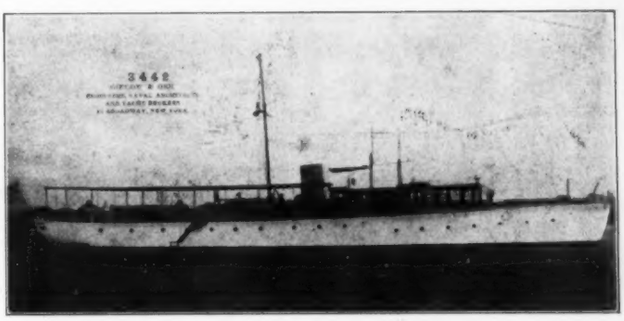
No. 366.—Sale, Charter; 200 ft.; ten staterooms; very desirable.
Please mention MOTOR BOATING.



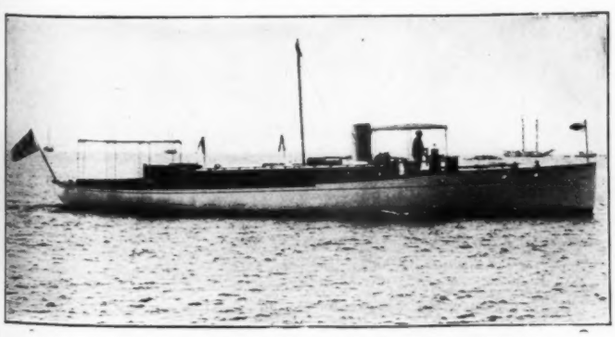
No. 565.—Sale, charter; 145 feet, 13 knots, 2 double, 3 single staterooms.
Please mention MOTOR BOATING.



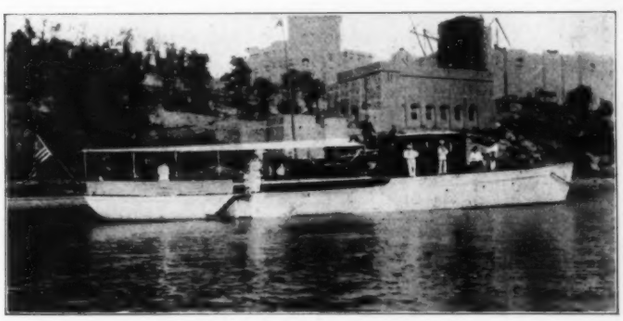
No. 2570.—Sale, Charter; 75 ft. twin screw; two staterooms.
Please mention MOTOR BOATING.



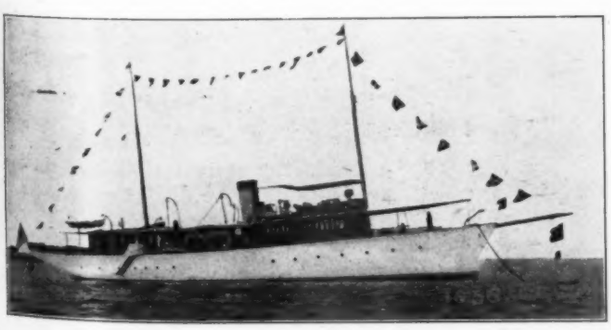
No. 3442.—Sale, charter; 118 foot, twin screw, steel, 17 miles, 3 staterooms.
Please mention MOTOR BOATING.



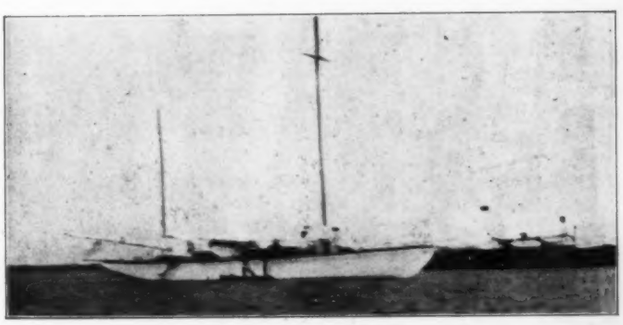
No. 3663.—Sale, 70 ft.; sleeps six; speed 13½ miles.
Please mention MOTOR BOATING.



No. 2360.—Sale, Charter; 80 ft.; deck dining saloon.
Please mention MOTOR BOATING.



No. 1656.—Sale, Charter; 130 ft.; 6 staterooms; speed 14 miles.
Please mention MOTOR BOATING.



No. 3303.—Sale, Charter, 97 x 20 x 4.6 ft. 4 staterooms. 40-65 h.p. motor.
Please mention MOTOR BOATING.

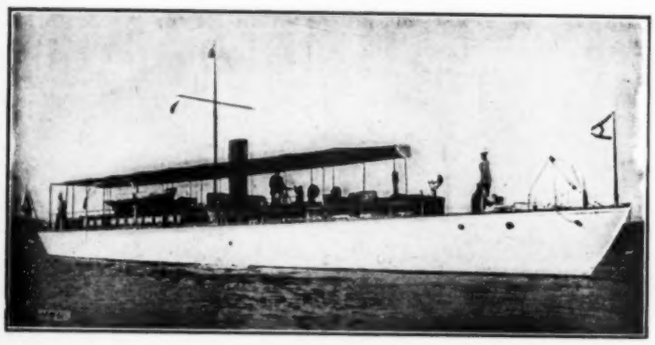
TAMS, LEMOINE & CRANE

Telephone
4510 John

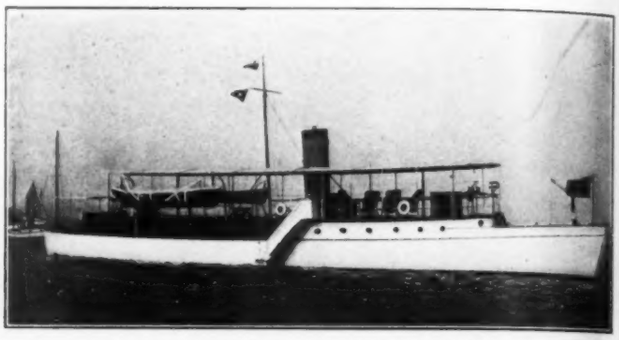
NAVAL ARCHITECTS AND YACHT BROKERS

52 Pine Street
New York City

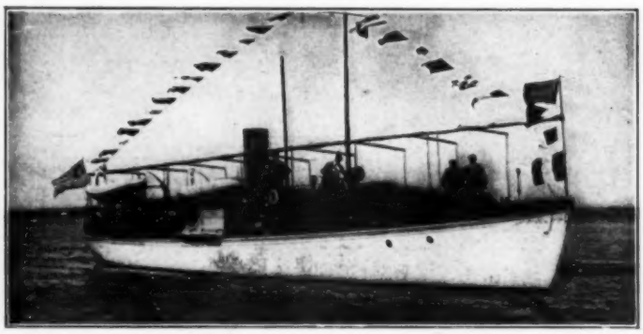
Offer for sale the following yachts, a large number of which are available for charter.



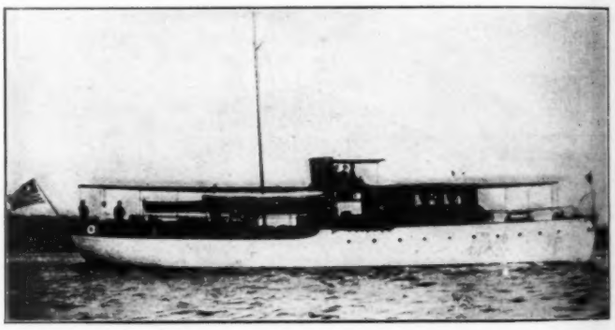
No. 7424.—91 ft. power boat; two 125 H. P. Craig engines; speed 18 to 20 miles. Price exceptionally low.
Please mention MOTOR BOATING.



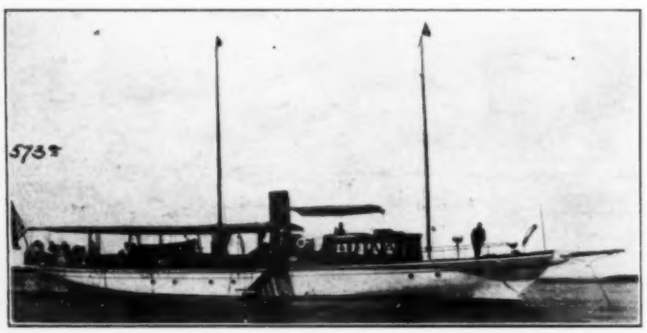
No. 7291.—For Sale.—92 ft. seagoing motor yacht; Twentieth Century motor; excellent condition.
Please mention MOTOR BOATING.



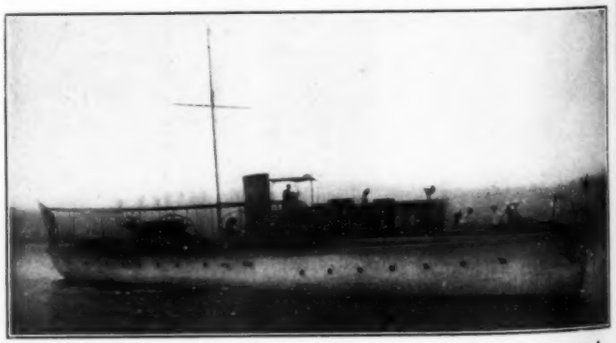
No. 7286.—For Sale, might charter, 95 ft. twin screw; speed 14-16 miles. Price attractive.
Please mention MOTOR BOATING.



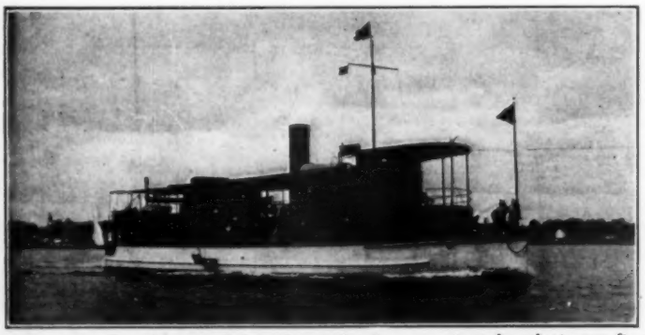
No. 7877.—For Sale.—Modern raised deck cruiser, 90 ft. x 83 ft. x 17 ft. x 3 ft. 6 in. draught; built 1909; saloon, 3 staterooms, bath, 3 W. C.'s, 2-60 H. P. Craig motors;
Please mention MOTOR BOATING.



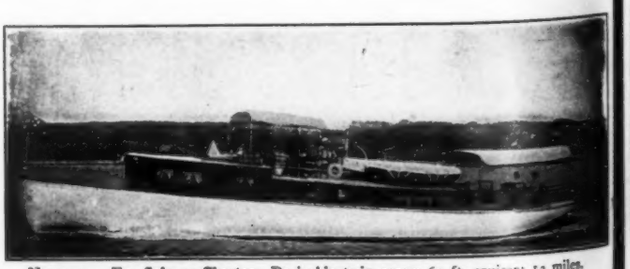
No. 7729.—For Sale or Charter—Desirable 90 ft. twin screw; three double staterooms; main and dining saloons, bathroom, etc. Unusual bargain.
Please mention MOTOR BOATING.



No. 7999.—For Sale or Charter—Fast twin screw power yacht. Exceptional accommodations.
Please mention MOTOR BOATING.



No. 1849.—For charter and for sale; steel twin screw steam houseboat; 115 ft. x 17 ft. x 3 ft. 6 in.
Please mention MOTOR BOATING.



No. 7334.—For Sale or Charter—Desirable twin screw 65 ft. cruiser; 12 miles.
Please mention MOTOR BOATING.

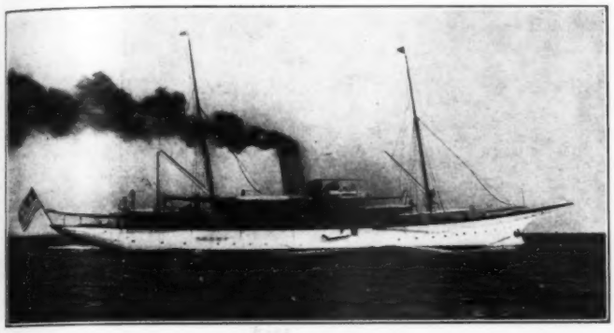
FRANK BOWNE JONES, Yacht Agent

29 Broadway, New York

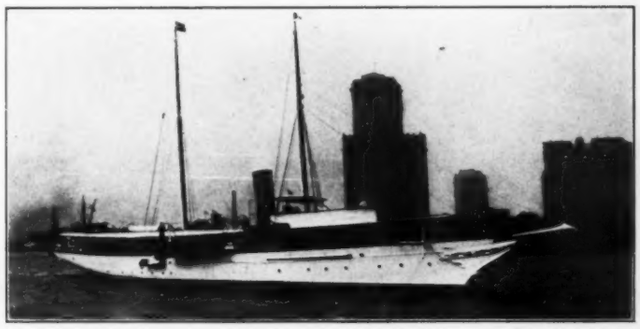
High Class Yachts of all types for sale and charter

MORGAN BARNEY, Naval Architect **Telephone, Rector 3890**

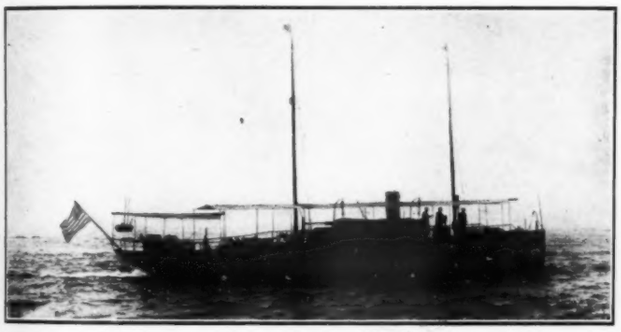
LET US KNOW YOUR REQUIREMENTS



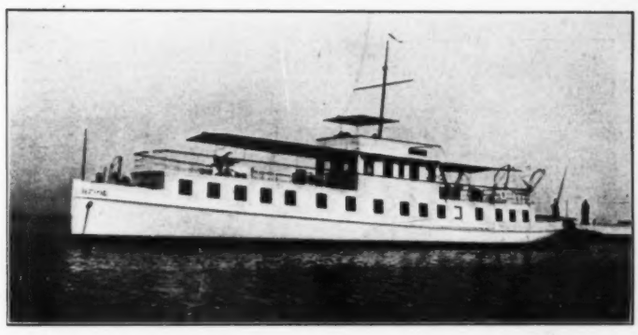
No. 3904.—200 ft. seagoing steam yacht. Accommodations aft. Reasonable price.
Please mention MOTOR BOATING.



No. 878.—145 ft. modern steel steam yacht. Available for purchase or charter.
Please mention MOTOR BOATING.

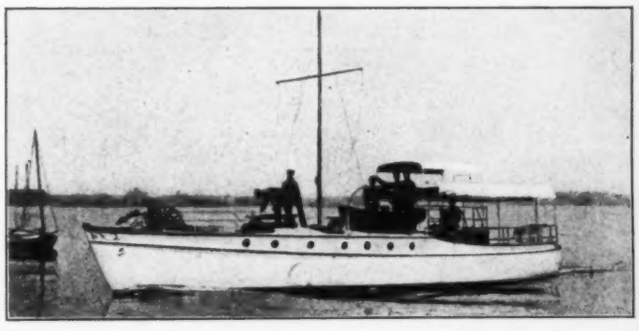


No. 5929.—85 ft. gasoline cruiser, Standard engine. Good as new.
Please mention MOTOR BOATING.

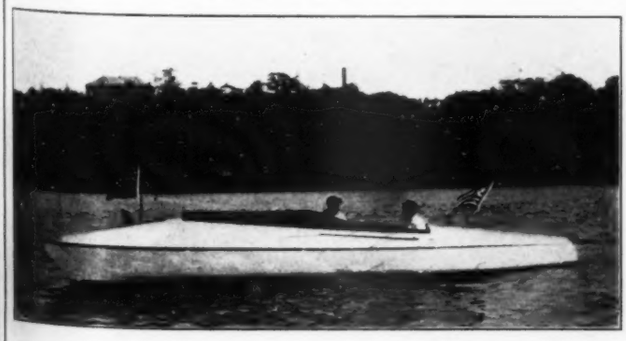


No. 5831.—110 ft. twin screw gasoline houseboat, speed 10 knots. Charter only.
Please mention MOTOR BOATING.

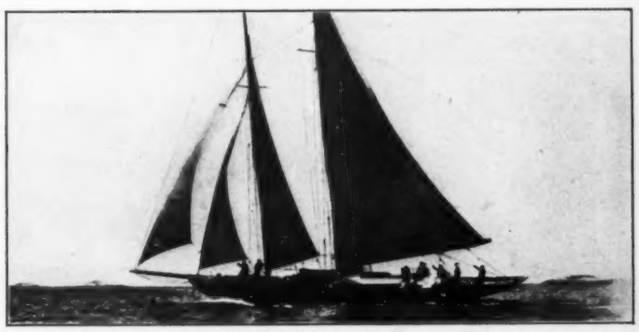
No. 4490.—40 ft. raised deck and trunk cabin cruiser. Excellent accommodation.
Please mention MOTOR BOATING.



No. 4108.—57 ft. raised deck cruiser. Standard motor.
Please mention MOTOR BOATING.



No. 3350.—27 ft. speed launch, A-1 condition, low price.
Please mention MOTOR BOATING.



No. 4496.—Auxiliary schooner, 50 ft. waterline. 25 H. P. engine.
Please mention MOTOR BOATING.

A. J. McINTOSH YACHT AGENCY

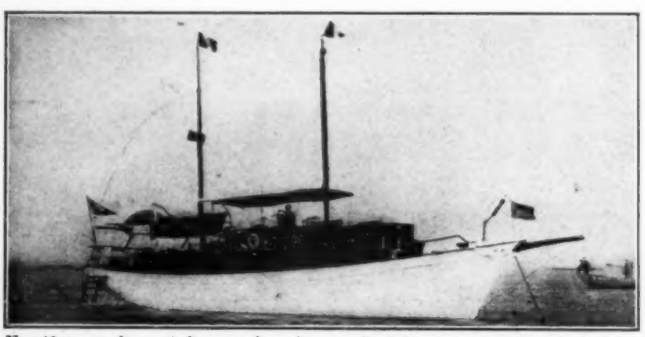
Telephones---
Broad 4886-4887

NEW YORK CITY

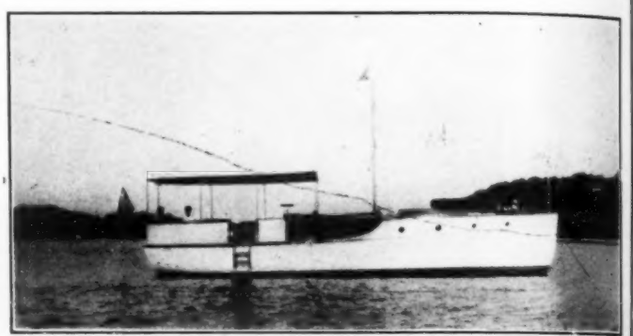
32 Broadway

Highest Grade Yachts of All Types For Sale or Charter---
Motor Boats---Steam---Sailing Craft

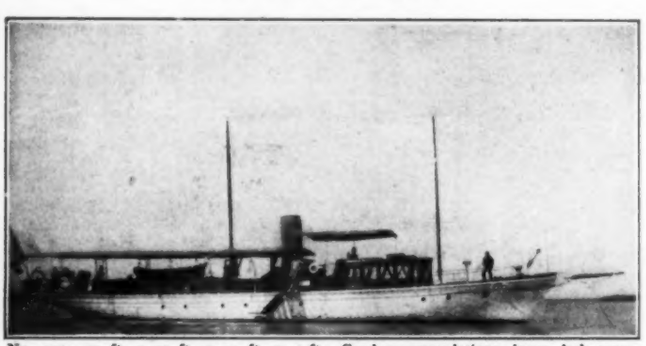
Correspondence Invited - - - - - - - - - - Descriptions Furnished



No. 6694.—70 ft. x 36 ft. x 12 ft. 9 in. x 4 ft. 6 in.; two staterooms, bath, large bridge; 60 H. P.; unusual bargain.
Please mention MOTOR BOATING.

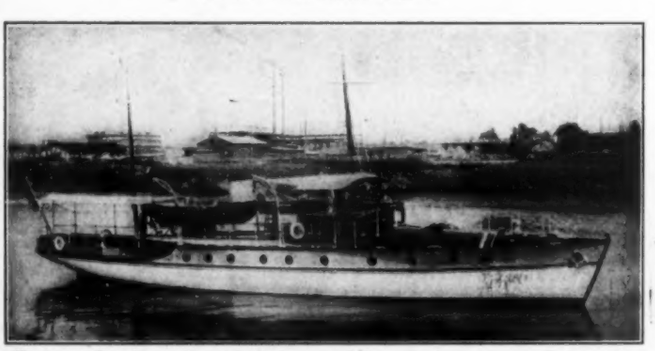


No. 948.—40 x 9 x 3.6; 20 H. P. Standard.
Please mention MOTOR BOATING.

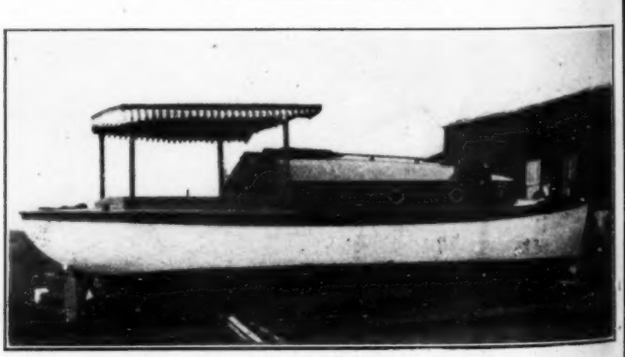


No. 392.—90 ft. x 75 ft. x 14 ft. x 3 ft. Good accommodations, large deck space, twin screws. Reasonable price.
Please mention MOTOR BOATING.

No. 742.—41 x 36.6 x 10 x 3; 24 H. P. Lamb motor.
Please mention MOTOR BOATING.

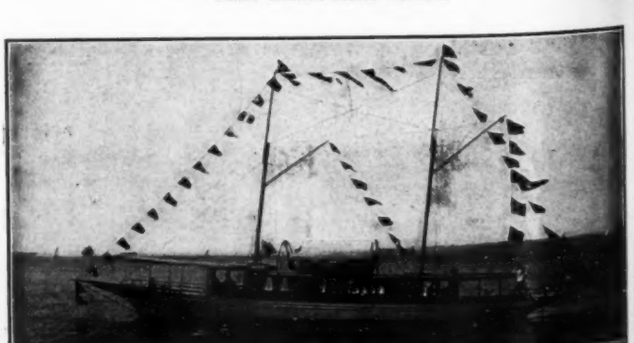


No. 701.—Stanch 70 ft. cruiser, in commission; 60 horse power Craig engine. Inspection invited.
Please mention MOTOR BOATING.



No. 1060.—35 x 9 x 3.6; 20 H. P. motor. Low price.
Please mention MOTOR BOATING.

No. 7735.—100 x 17 ft. power yacht; 150 H. P. Craig; price low.
Please mention MOTOR BOATING.



No. 8054.—67 x 10.6 x 3; 40 H. P. Standard; now has rail around entire top of house; good passenger boat; accommodates 40 outside; 30 inside.
Please mention MOTOR BOATING.

HENRY H. JENNINGS, 20 years
HERMAN JAGLE, 14 years } with the late **MANNING'S YACHT AGENCY** are now in business under the name of

Jennings Yacht Brokerage Company

AMERICAN AND FOREIGN YACHTS

Merchant Vessels for Sale and Charter

HAMBURG-AMERICAN BUILDING

Telephone Rector 8545

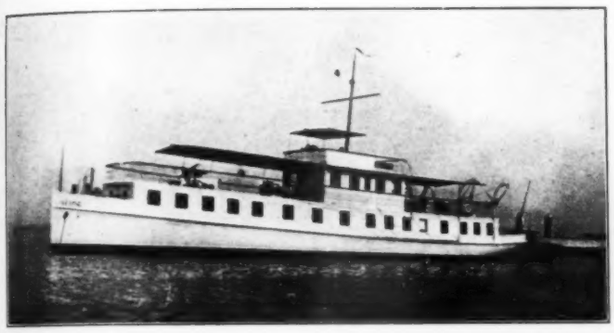
Cable Address, Yachtbroco, Newyork

45 Broadway, New York City

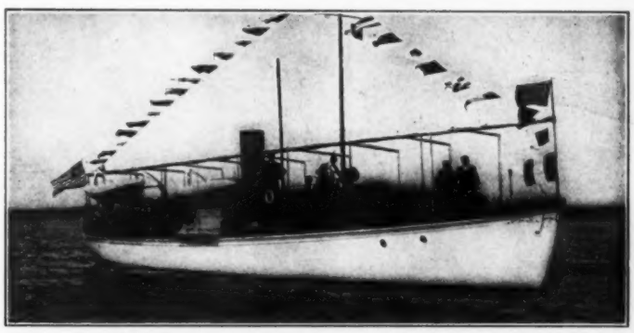
Surveying
Marine Insurance

AGENCY FOR
MORAVIA ANTI-FOULING PAINTS

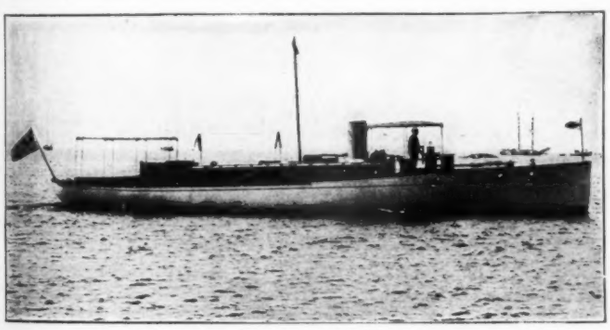
Our list comprises all the available yachts for sale and charter. Below are a few of our offerings. If none of these appeal to you write us your requirements.



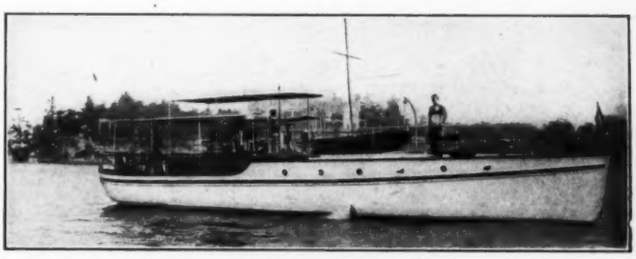
No. 4068.—110-foot twin screw gasoline houseboat, conceded to be one of the best in this country; ideal accommodation and luxuriously furnished; speed 10 knots. Owner going abroad, will consider chartering.



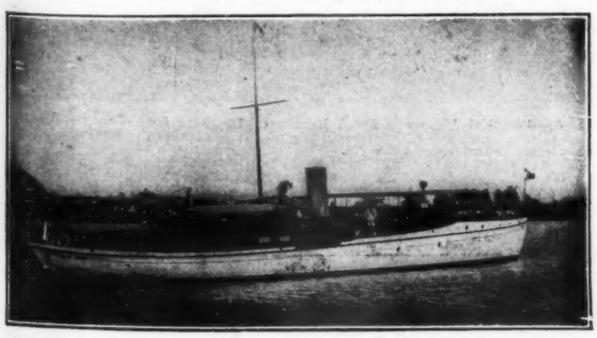
No. 1146.—95 foot cruiser, twin screw; speed 15 miles.
Please mention MOTOR BOATING.



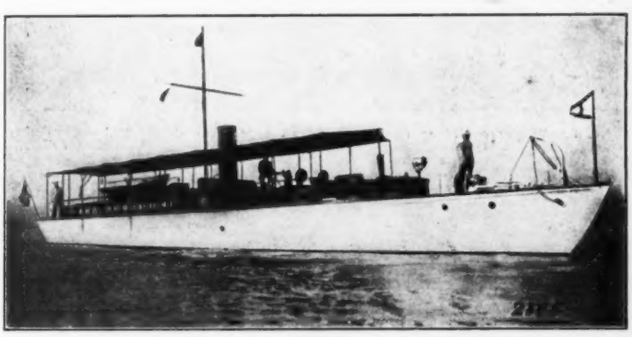
No. 1197.—70 foot cruiser; speed 13½ miles.



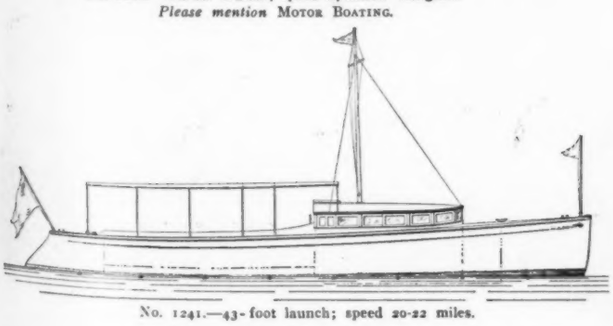
No. 1004.—60-foot cruiser; speed 12 miles.
Please mention MOTOR BOATING.



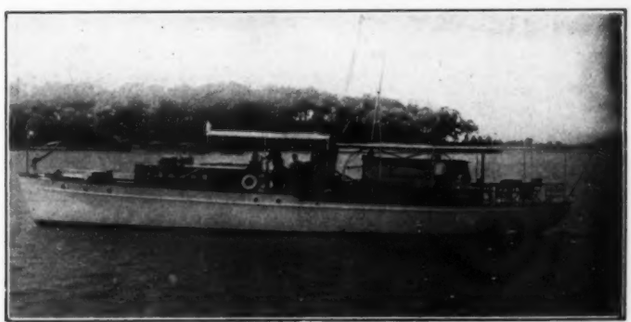
No. 1061.—100-ft. cruiser; speed 14 miles. Bargain.
Please mention MOTOR BOATING.



No. 982.—91-foot power yacht, twin screw; speed 16 miles. Price low.



No. 1241.—43-foot launch; speed 20-22 miles.
Please mention MOTOR BOATING.



No. 1202.—65 foot cruiser; speed 12 miles. Price low.

RELIANCE MOTOR BOATS

"IT TAKES A RELIANCE TO BEAT A RELIANCE"

Construction Without an Equal **Speed Greatest Obtainable**

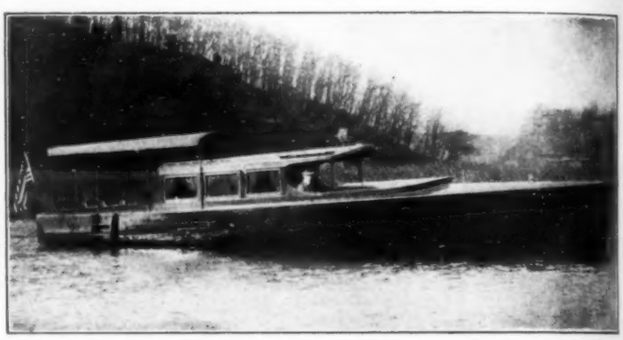
The Reliance Motor Boat Co.
Builders and Designers

Offer several of our own magnificent products taken in trade from parties for whom we built more elaborate outfits. Also owners' boats on storage: Cabin cruisers, Day cruisers, Runabouts. Write us. We can supply your wants.

210th Street and Harlem River
New York City
Telephone 7510 Audubon

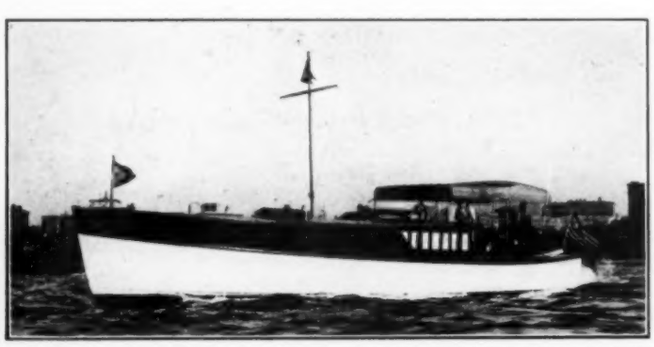
No. 72—21 ft. Runabout. Equal to brand new. Mahogany deck and transom, mahogany lazy backs, carries six. 30 h. p. Reliance motor. Bosch magneto, rear starter; speed 21 miles.

Please mention MOTOR BOATING.



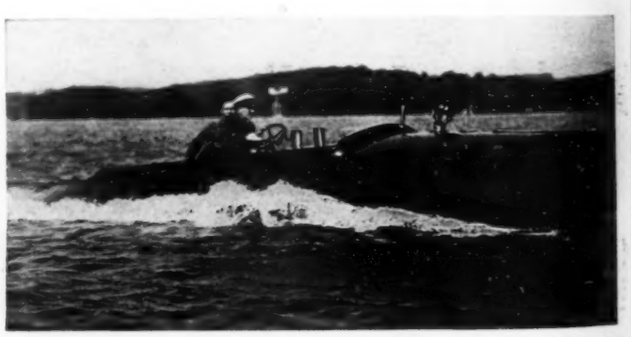
No. 83—40 FT. DAY CRUISER, 7 ft. 6 in. beam BRAND NEW. Mahogany throughout. Equipped with 90 h. p. Van Blerck motor, Bosch Dual magneto, rear starter. Speed 20 miles. Great bargain.

Please mention MOTOR BOATING.



No. 82—"Idylease II," 47 ft. x 10 ft., draft 3 ft., flush deck. Mahogany decks, coamings, etc., toilet, lavatory, etc. Sleeps six. Equipped with Monarch 4 cylinder 20 h. p. motor. Speed 11 miles. Fine sea boat. Absolutely dry. Bargain.

Please mention MOTOR BOATING.

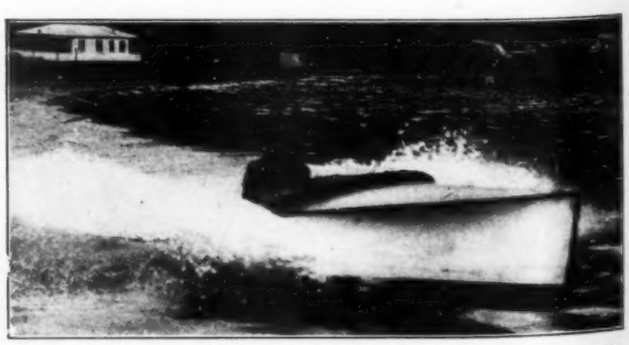


No. 84—Beautiful Mahogany Speed Runabout. Duplicate famous "Peter Pan II." equipped with Reliance Continental 25 h. p. motor. Thoroughly refinished. Motor absolutely brand new. Great bargain.

Please mention MOTOR BOATING.

No. 85—Commodore Blackton's famous Vita (Elco Yacht Tender) with 40 H. P. Silent Knight motor. The motor imported from England and installed for Florida races. Just won six cups St. Augustine and Jacksonville. Account building other boats sell half price ($1,500).

Please mention MOTOR BOATING.



No. 77—New Auto Speed Runabout, 21 x 4 ft. 6 in. Speed 18 miles. 20 h. p. Reliance motor. Very high class. Carries six. All appointments. Exhibited at N. Y. Motor Boat Show. $900. A bargain.

Please mention MOTOR BOATING.

Showrooms:
132 Liberty Street, New York

Demonstrating Warehouse:
325 Central Ave., Jersey City, N. J.

Marine Railway & Boat Yard:
Foot East 40th & 41st Sts., Bayonne, N. J.

BRUNS-KIMBALL & CO., Inc.

Telephone, 2614 Rector

The Largest General Marine Agents and Yacht Brokers

132 LIBERTY STREET

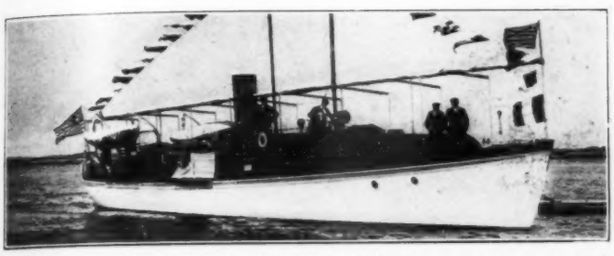
High Grade Yachts and Launches for Sale or Charter. Over 2000 listed.

New York City

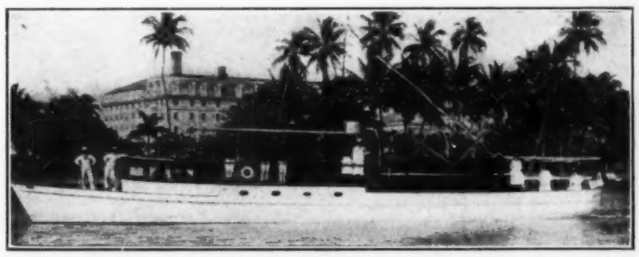
WE CAN REFER YOU TO OVER 1000 SATISFIED CUSTOMERS

IF YOU DESIRE TO DISPOSE OF YOUR YACHT, LAUNCH OR ENGINE, IT WILL BE TO YOUR ADVANTAGE TO COMMUNICATE WITH US IMMEDIATELY.

OUR BEST ADVERTISER IS A SATISFIED CUSTOMER

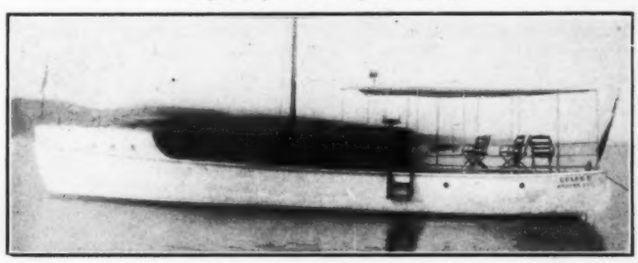


No. 1.—93 x 13½ x 4; built by Electric Launch Company 1907; two 100-125 H. P. Standard motors, twin screws; speed 16 miles; price very attractive.



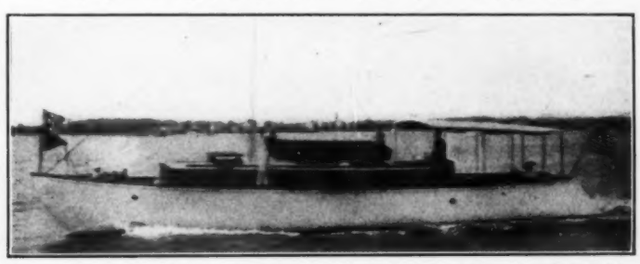
No. 2.—80 x 12 x 3½; built by Electric Launch Company 1904; two 90 H. P. Craig engines; speed 16 miles; offer wanted.

No. 3.—85 x 15½ x 3 ft. 9 in.; built 1911; 100-125 H. P. Standard motor; price attractive.



No. 4.—48 x 12 x 3; built 1910; 40 H. P., four cycle motor; price $3,500.

No. 5.—35 x 5½; less than two years old; 46-55 H. P. Vim engine; speed 22 miles; cost nearly $3000; will sell, quick sale, $850.



No. 6.—55 x 10½ x 3 ft. 6 in.; built 1907; 30 H. P. Craig; speed 13 miles; quick sale, $4000.

SECOND HAND ENGINES

We price them as follows:
EXCELLENT—Means that the motor has had but little use.
GOOD—Not badly worn; good appearance.
FAIR—Includes everything not classified under "Excellent" and "Good."
All engines listed below are Marine Engines, unless otherwise specified.
EQUIPMENT—All engines, unless otherwise specified, are fitted with a gasoline generator or carburetor, shaft coupling, and a circulating pump and timer.
PROPELLER OUTFIT—We furnish a propeller outfit with each engine, if specified.
HORSE POWER—We do not guarantee the horse power of these second hand engines. The age and model are given approximately.
EXTRAS—Battery outfits, gasoline tanks, pipe and fittings are not included.
"M. & B." means make and break spark; "JUMP" means jump spark.

Description.	Price.
500 H.P. Standard	$6,000
300 H.P. Standard	2,500
300 H.P. Standard, perfect condition, 6 cyl., 12 in. x 14 in. shaft and propeller, air starting and reversing	3,000
120 H.P. Pope Toledo, 4 cyl., 4 cycle, 7¼ x 6½	700
100-125 H.P. Emerson, 1911, 6 cyl., complete outfit, Bosch magneto	750
105 H.P. Peerless, high speed, 4 cyl., 4 cycle, 6½ x 6½ engine, only	550
100 H.P. Standard, 1910, outfit	2,000
100 H.P. Sterling, 8 cyl., 1911, high speed, full outfit	1,500
100 H.P. Anderson, 9¼ x 11, 4 cycle, new	1,800
90 H.P. Globe, 4 cyl., reverse gear, propeller outfit, muffler, 10¾ x 14	3,500
90 H.P. Truscott, 6 cyl., 6 x 7, high speed	900
90 H.P. Globe, 4 cyl., 4 cycle, M & B, 10 in. bore, 14 in. stroke, propeller and vaporizer, reverse gear	2,500
60 H.P. Emerson, 4 cyl., 2 cycle, 2 Schebler carbureters, Bosch magneto, reverse gear	350
56 H.P. Automatic, 4 cyl., 4 cycle, 7½ x 9, full outfit, reverse gear	1,500
50 H.P. Muskatine, 4 cyl., 5 x 5, full outfit	425
50 H.P. Gibbs, 4 cyl., 4 cycle, outfit	550
50 H.P. Hicks, 6 cyl., 2 cycle, 1908, complete	500
45-55 H.P. Vim, 1910 model, propeller outfit, spark coil	400
45 H.P. American, 3 cyl., 2 cycle, jump, 6½ x 7	250
45 H.P. American Daimler, 4 cyl., 4 cycle, 4¾ x 6½, carburetor, Bosch low tension magneto	400
40-60 H.P. Roberts, 6 cyl., 2 cycle, 1910, 4½ x 5, electrical equipment, jump spark	600
40-50 H.P. Van Epps, 4 cyl., 2 cycle, 1911 Schebler carbureter, J. S. high speed, new	375
40 H.P. Truscott, 4 cyl., 4 cycle, full outfit, guaranteed	500
40 H.P. Sintz, 1 cyl., 2 cycle, jump spark, gear, Schebler carbureter, Connecticut coil	500
40 H.P. Van Auken, twin screw, complete outfit	300
40 H.P. Trebert, 4 cyl., 4 cycle, 5 x 5, Schebler carbureter	225
35 H.P. Globe, 4 cyl., latest model	1,200
35 H.P. Remington, 1909, 2 cyl., 8¾ x 8, kerosene	750
28-30 H.P. Wonder, 4 cyl., 2 cycle, 4¾ x 4¾, propeller, coil, Holley carburetor	225
28-32 H.P. Eddystone-Globe, 5½ x 5, 4 cyl., magneto outfit, Paragon gear	450
30 H.P. Watertown, 3 cyl., 2 cycle, 5 x 5, 900 r.p.m., 1908, not run over 500 miles, reverse gear and outfit	350
28 H.P. Yale, 4 cyl., 4 cycle, 4¾ x 4¾, Schebler carbureter and coil	200
27 H.P. Vim, 3 cyl., 1909 carburetor	200
25 H.P. Globe, 8¼ x 10, 2 cyl.	$750
25 H.P. Lozier, 1907, 4 cyl., 5 x 6	375
25 H.P. Barber, 3 cyl., 2 cycle, Paragon gear, full outfit	250
25 H.P. Giant, 4 cyl., 2 cycle, new carburetor, coil	550
24 H.P. Harvard, 4 cyl., 4 cycle, jump spark, 5 in. bore, 6 in. stroke, Schebler carbureter	275
25 H.P. Graef, 1 cyl., 4 cycle, 8 x 10	200
22 H.P. Meitz & Weiss, 1908, 3 cyl., outfit, reverse gear	400
25-25 H.P. Atlas, 3 cyl., 4 cycle, 6 x 6½, no outfit, new	350
20 H.P. Lozier, 2 cyl., 4 cycle, 7 x 8	350
18 H.P. Standard, 3 cyl., 1907, complete outfit, latest improvements	850
18 H.P. Ellsworth, 2 cyl., 2 cycle, reverse gear, propeller and coil	200
18 H.P. Truscott, 4 cyl., 4 cycle, 5¾ x 5¾, 1911 model, propeller, magneto, Balbridge gear, coil, plugs and wire	550
18 H.P. Globe, 2 cyl., 4 cycle, 6½ x 8½	550
17 H.P. Eclipse, 3 cyl., 2 cycle, 3 Schebler carbureters, coil, steel shaft, jump spark, reverse gear	100
16-25 H.P. Murray & Tregurtha, 2 cyl., 4 cycle, M & B, carbureter, reverse gear, 7⅝ in. bore, 11 in. stroke	550
16 H.P. Eagle, 4 cyl., 4 cycle, reverse gear, outfit	250
16 H.P. Empire, 2 cyl., 6 x 8, 4 cycle, 1,400 lbs., no gear, no outfit	200
16 H.P. Daimler, 2 cyl., 6½ x 8, propeller, coil	225
16 H.P. Globe, 2 cyl., 4 cycle, full outfit, 7 x 9	475
16 H.P. Globe, 2 cyl., 4 cycle, M & B, 7 in. bore, 9 in. stroke, new Schebler carburetor, propeller outfit, spark coil	450
15 H.P. Bridgeport, 2 cyl., 2 cycle, with gear and carbureter	200
15 H.P. Mianus, and outfit	225
15 H.P. Craig, 3 cyl., electrical equipment, propeller, jump spark	350
15 H.P. Perro, 2 cyl., 2 cycle, full outfit, 5 x 5	250
15 H.P. Brennan, 2 cyl., 4 cycle, jump spark, opposed	120
15 H.P. Meitz & Weiss, 2 cyl., 1909, reverse gear, (kerosene)	400
15 H.P. Lozier, 2 cyl., 2 cycle, reverse gear, full outfit	250
15 H.P. Buffalo, 4 cyl., 4 cycle, reverse gear, carbureter, coil	300
15 H.P. Mianus, 2 cyl., 2 cycle, 5-9/16 in. bore, 6 in. stroke, Schebler carbureter, propeller, M & B.	250
15 H.P. Buffalo, 4 cyl., 4 cycle, 4½ in. bore, 5 in. stroke, Schebler carbureter, jump spark	200
15 H.P. Fulton, 2 cyl., 2 cycle, 5½ x 6, Joe's gear, shaft, propeller, stuffing box, coil, carbureter	250
15 H.P. Mianus, with gear and outfit	275
12-15 H.P. Vim, 2 cyl., aluminum base, high speed, 1911, Bosch magneto, coil, carbureter	150
12-16 H.P. Eddystone-Globe, new, 1911 model, carbureter, coil	$200
Two 12 H.P. Standards, 2 cyl., magneto, propeller outfit, reverse gear, each	500
12 H.P. Mianus, 2 cyl., 2 cycle, M & B, 5-9/16 in. bore, 6 in. stroke, Schebler carbureter, bronze shaft and propeller	200
12 H.P. Pharo, 2 cyl., 2 cycle, 4¾ x 4½, 1909, propeller outfit, reverse gear, coil	150
10-14 H.P. Eddystone-Globe, 2 cyl., 2 cycle, 5⅛ in. bore, 6 in. stroke, jump spark, bronze shaft and propeller, Schebler carbureter, Paragon reverse gear, 1910	175
10 H.P. Lathrop, 1 cyl., 7 x 7½, only used a few days	140
10 H.P. Globe, 2 cyl., 4 cycle, 6 x 7 generator valve, coil	250
10 H.P. Standard, 2 cyl., 4 cycle, M & B, Long Distance carbureter only	150
10 H.P. Racine, Cone Clutch	80
H.P. Bridgeport, 1 cyl., Schebler carbureter, 22 in. 3-blade propeller, shaft	175
9 H.P. Knox, 2 cyl., 2 cycle, carbureter, Perfect ignition	125
8½ H.P. Bridgeport, electrical equipment, coil	100
8 H.P. International, 2 cyl., 2 cycle	90
8 H.P. Lathrop, 1907, 6½ x 6½	110
8 H.P. Stanley, 2 cyl., 2 cycle, J S Vaporizer	115
7½ H.P. Universal, with reverse gear	100
7½ H.P. Buffalo, 2 cyl., 4 cycle, gear, propeller, coil and carbureter	185
7 H.P. Eagle, 6 x 6½ cyl., 2 cycle, M & B	75
7 H.P. Schneckner, coil, wheel, Schebler carbureter shaft	70
6 H.P. Lathrop, 1 cyl., 2 cycle, M & B 5¼ in. bore, 6½ in. stroke, bronze shaft propeller	78
6 H.P. Lippert Missouri, 2 cyl., 4 cycle, gear, propeller, coil carbureter, shaft	175
6 H.P. Fairbanks-Morse, 2 cycle, M & B, reverse gear, oil cups, vaporizer	75
6 H.P. Clay, 1 cyl., 4 cycle, year guarantee	110
6 H.P. Globe, 1 cyl., latest model	270
5½ H.P. Eagle, wheel, shaft, stuffing box, coil, 1906	55
5 H.P. Lathrop, no outfit	60
5 H.P. Royal	60
5 H.P. Tuttle, and outfit	60
6 H.P. Clay, 1 cyl., 4 cycle, year guarantee	110
Two 5½ H.P. Palmers, 1 cyl., 2 cycle, complete, each	65
4-5 H.P. 2 cyl., 2 cycle, Wonder, 1909, steel shaft, wheel, full electrical outfit, vaporizer	90
3½ H.P. Palmer, outfit	45
3 H.P. Lozier, reverse propeller	40
3 H.P. Globe, 1 cyl., latest model	175

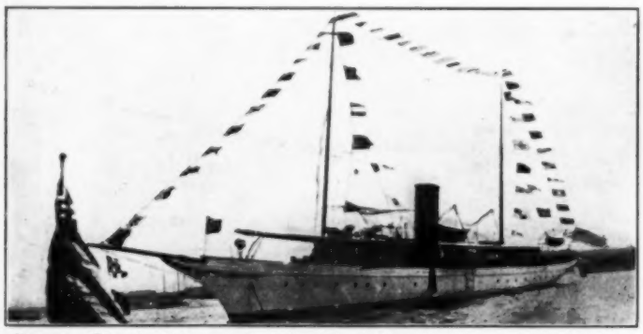
COX & STEVENS

Telephone
1375 Broad

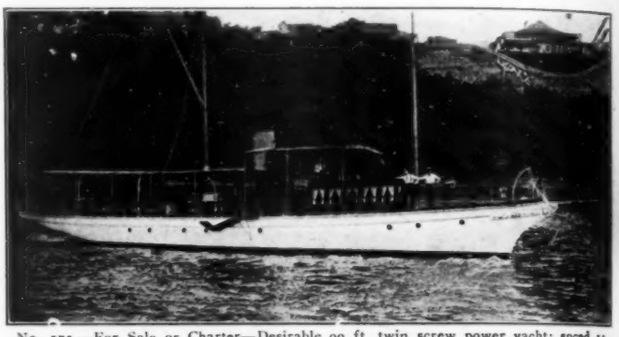
NAVAL ARCHITECTS
AND
YACHT BROKERS

15 William Street
New York City

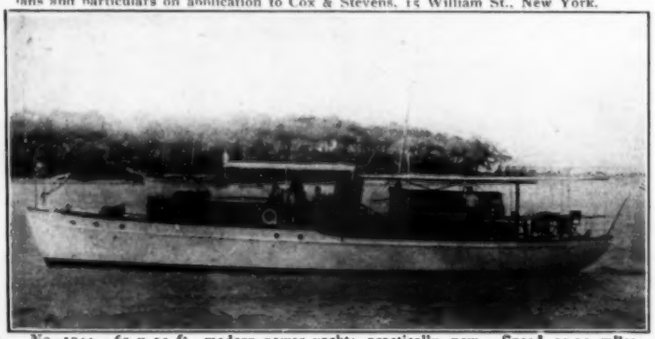
We have a complete list of all steam and power yachts, auxiliaries and houseboats available for SALE and CHARTER for WEST INDIES and FLORIDA. A few are shown on this page. Plans, photographs and full particulars mailed on request.



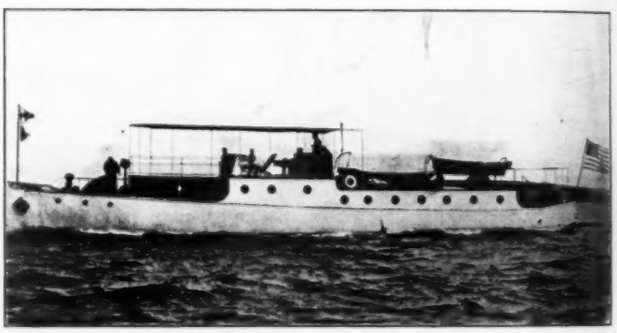
No. 107.—Exceptional Opportunity.—American built modern fast 170 ft. steel steam yacht in perfect condition. Two deck houses, five staterooms, three bathrooms. All hardwood finish. Complete equipment. For quick sale will accept very low figure. Full plans and particulars on application to Cox & Stevens, 15 William St., New York.



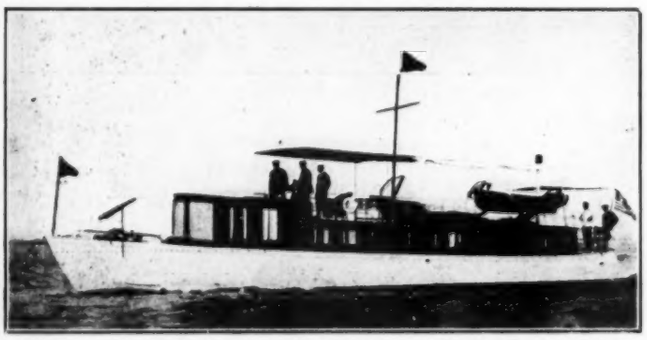
No. 573.—For Sale or Charter—Desirable 90 ft. twin screw power yacht; speed 11 miles; large accommodations, including three double staterooms, main and dining saloons, bathroom, etc.; in first-class condition; handsomely finished and furnished; unusual bargain. Cox & Stevens, 15 William St., New York.



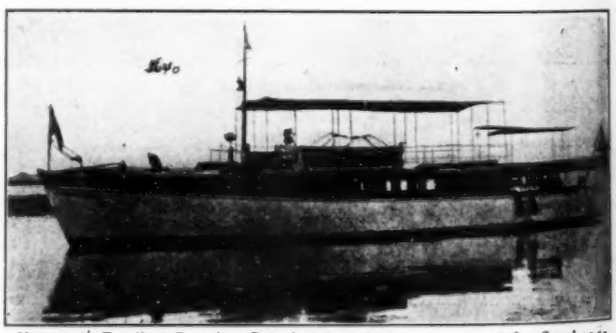
No. 1744.—65 x 13 ft., modern power yacht; practically new. Speed 11-12 miles; 40-50 H. P. Standard. Two double staterooms, dining saloon, bath, etc. Probably best of type and size available. Cox & Stevens, 15 William St., New York.



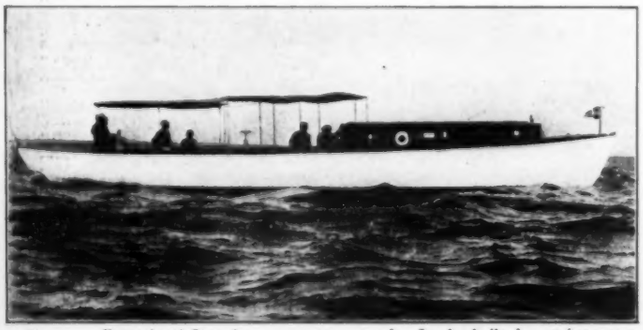
No. 175.—Sacrifice.—Comfortable and able 86 ft. power yacht, in first-class condition. Speed 12 to 14 miles. Large accommodation. Unusual opportunity; owner has larger from our design. Cox & Stevens, 15 William St., New York.



No. 1227.—Exceptional Bargain.—Desirable cruising motor yachet, 70 x 12 x 3.10 ft. Built by Seabury in best manner. Speed 12-13 miles; 70 H. P. 20th Century motor. Handsomely finished in mahogany throughout. Pilot house, stateroom, main saloon, galley, etc. Owner has purchased larger power yacht through us. Cox & Stevens, 15 William St., New York.



No. 1640.—Excellent Bargain.—Raised deck cruiser, 57 x 11 x 3.6 ft. Speed 10-12 miles. Seabury build. Two single staterooms, 13 ft. saloon, etc. Handsomely finished in mahogany. Cox & Stevens, 15 William Street, New York.
Please mention MOTOR BOATING.



No. 910.—Exceptional Bargain.—53.5 x 10.3 x 3 ft.; Lawley-built day cruiser; very best construction; teak finish throughout; saloon with two transoms, toilet, etc.; completely found: will be sold without motor; best of type available. Cox & Stevens, 15 William St., New York.

No. 1596.—Excellent Bargain.—42.6 x 8.6 x 2.8 ft. raised deck cruiser. Built 1909. Speed 10 miles; 16-20 H. P. 4-cylinder Standard motor. Owner has larger. Apply to Cox & Stevens, 15 William St., New York.
Please mention MOTOR BOATING.

When writing to advertisers please mention MOTOR BOATING, *the National Magazine of Motor Boating.*

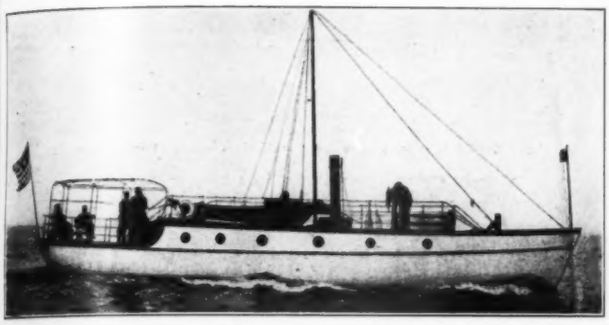
NAVAL ARCHITECTS
ENGINEERS
BROKERS
MARINE INSURANCE

GIELOW & ORR

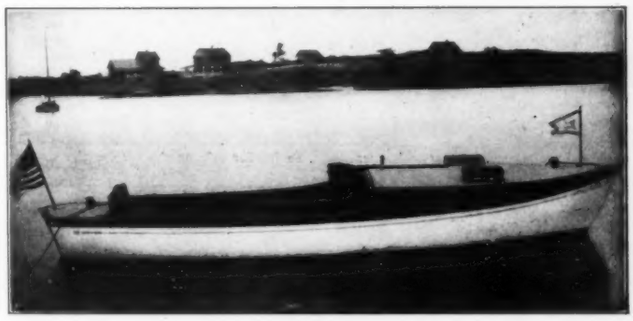
52 Broadway, New York

Write us to-day mentioning your requirements.

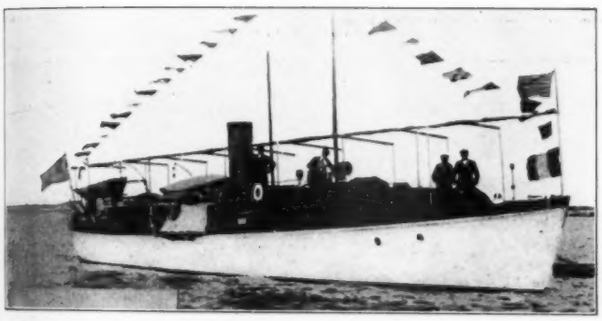
Telephones: {4673 / 4674} Broad
Cable Address:
Crogie, New York
A. B. C. Code



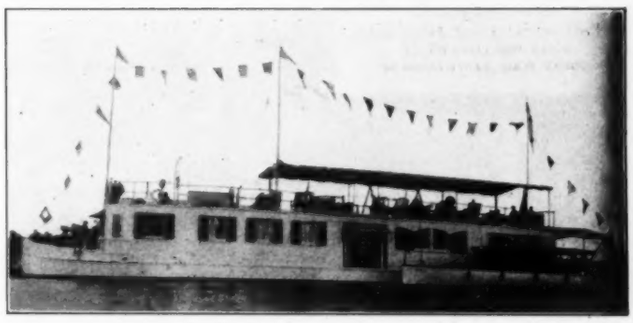
No. 2766.—Sale; 58 foot, off-shore cruiser, Standard motor.
Please mention MOTOR BOATING.



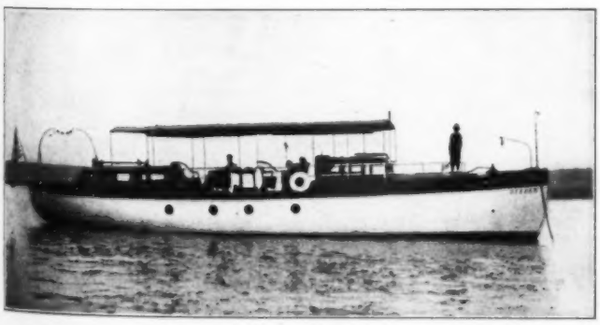
No. 3731.—Sale, 28 ft. Day cruiser.
Please mention MOTOR BOATING.



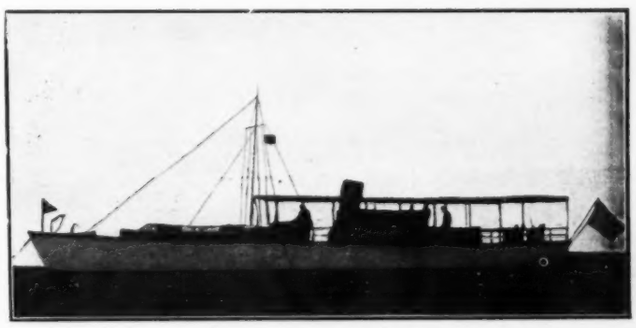
No. 3166.—Sale, Charter; 93 ft. twin screw, 12-15 miles. Price attractive.
Please mention MOTOR BOATING.



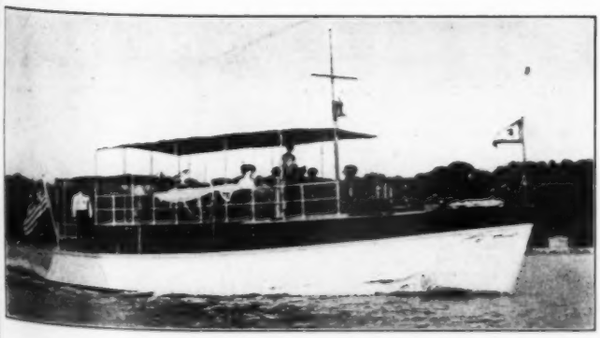
No. 3496.—Bargain, 98 ft.; twin screw; seven staterooms.
Please mention MOTOR BOATING.



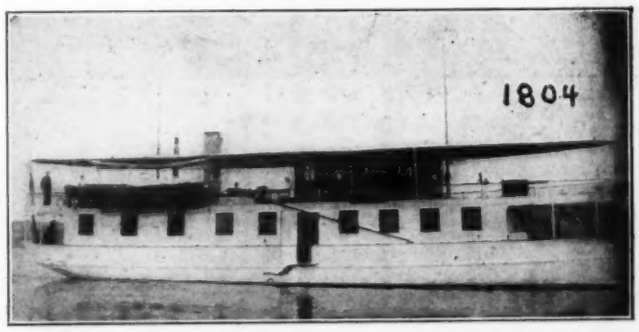
No. 2768.—Sale, 50 ft. Stateroom, two cabins, bath; now in commission.
Please mention MOTOR BOATING.



No. 1952.—Sale, 75 ft.; 15 miles; two staterooms. Excellent condition.
Please mention MOTOR BOATING.



No. 2516.—Price low, 57 feet, owner building larger.
Please mention MOTOR BOATING.



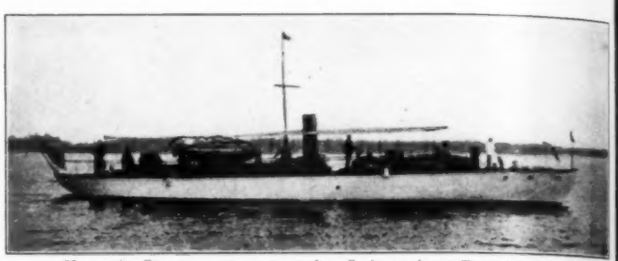
No. 1804.—Sale, charter; 84 foot, twin screw, 3 staterooms; price attractive.
Please mention MOTOR BOATING.

C. W. ESTABROOK, Yacht Broker for Selling and Chartering

Telephone, Fort Hill 3976 — 33 Broad Street, Boston, Mass. — Cable Address, "Ralestab" (W. U. Code)

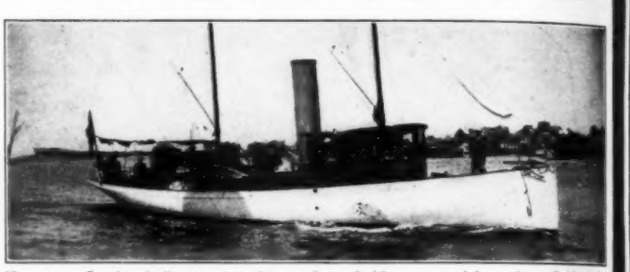
Steam, Gasolene, Auxiliaries, Schooners, Yawls, Sloops, Knockabouts, Houseboats, Marine Insurance

No. 986.—Lawley built auxiliary schooner yacht, 62 ft., for sale or charter for the season.



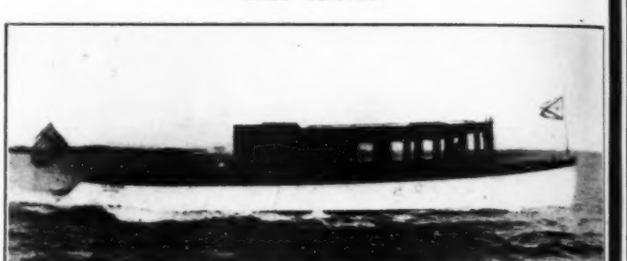
No. 556.—Fast express type, 91 ft.; Craig engine. For sale or charter.

No. 1150.—Steam yacht, 117 ft. o. a., 17 ft. beam; built 1903; new boiler, 1908. Sacrifice, offer solicited.

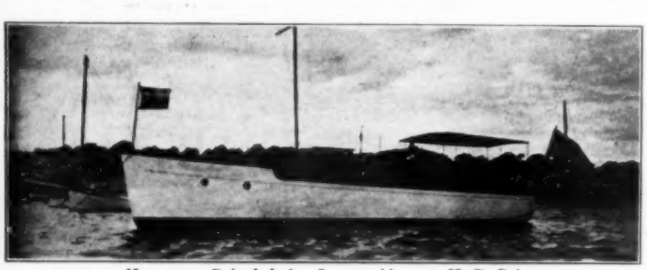


No. 1311—Lawley built steam yacht, 75 ft., suitable commercial service. Sold settle estate. Want offer.

No. 323.—Beautifully modeled power cruiser, 92 ft.; 100 H. P. Twentieth Century engine.



No. 1465.—Glass cabin cruiser, finished mahogany; Murray & Tregurtha engine, $4,500 asked. Make offer.

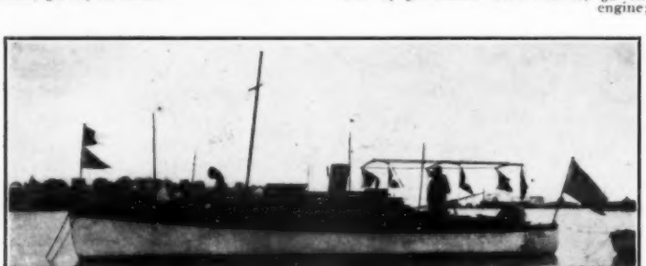


No. 1441.—Raised deck. Large cabin. 20 H. P. Ralaco.

No. 1507—Cruiser, 40 ft., raised deck, with bridge control; B. T. 20 H. P. engine. A great bargain.

No. 1136.—Fast day cruiser, 36 ft., 16 miles.

No. 1705.—Raised deck cruiser, 52 ft.; saloon; double stateroom; bath; Standard engine; built 1911.



No. 1709.—Power cruiser, 35 ft., must sell; offer solicited.

Please mention MOTOR BOATING.

When writing to advertisers please mention MOTOR BOATING, *the National Magazine of Motor Boating.*

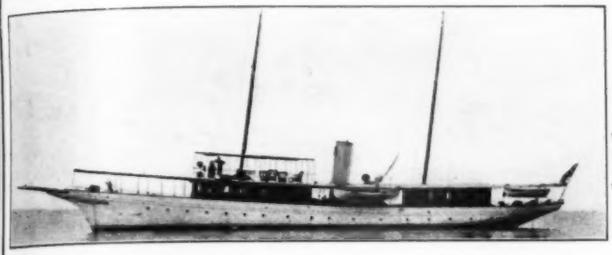
KROGMAN & PURDY

YACHT AND SHIP BROKERS
MARINE INSURANCE

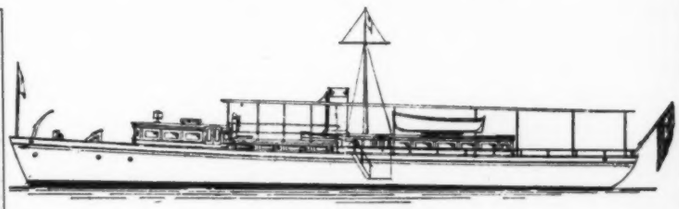
Telephone, Fort Hill 1629

92 State Street, BOSTON, MASS.

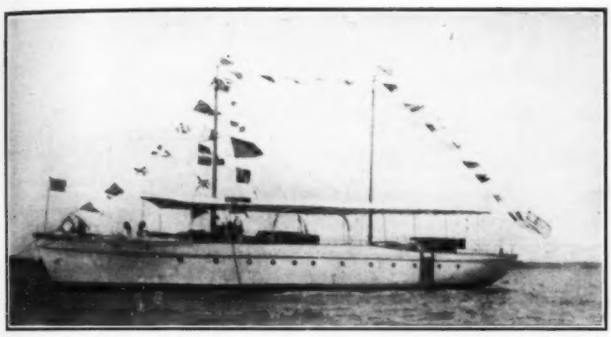
We have an extensive list of Yachts of every description for sale and charter. Plans, photos and full particulars furnished on request



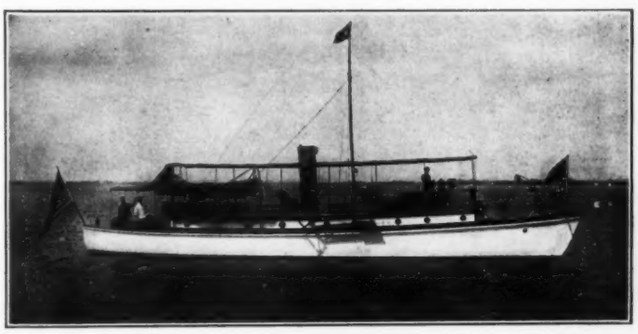
No. 524.—For Sale or Charter—130 ft. steam yacht; 5 staterooms, bath, etc. Speed 14 miles. Exceptional bargain.



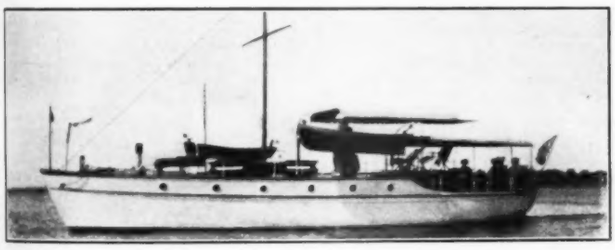
No. 764.—93 ft. cruiser; 2 100 H. P. Standard motors. Speed 14 miles. **Bargain.**
Please mention MOTOR BOATING.



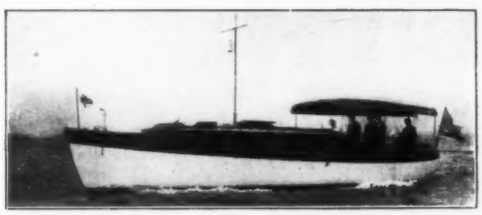
No. 752.—For Sale or Charter—75 ft. motor cruiser. Two staterooms, bath. Standard engine. Speed 12 miles. Price attractive.



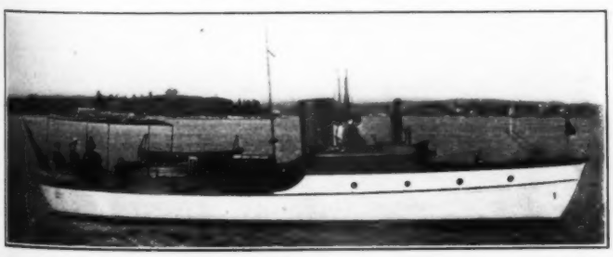
No. 831.—65 ft. cruiser; 2 staterooms, bath; Standard engine, speed 13 miles.
Please mention MOTOR BOATING.



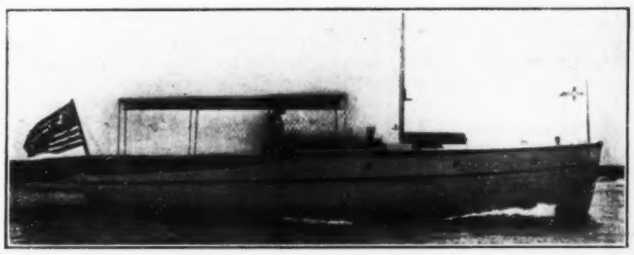
No. 695.—Motor cruiser, 55 x 12 x 3 ft.; 2 staterooms. Price attractive.
Please mention MOTOR BOATING.



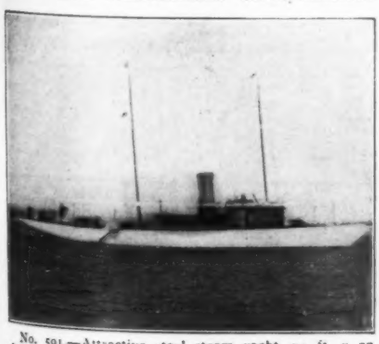
No. 474.—Desirable 40 ft. cruiser; built 1910; stateroom; complete inventory; exceptionally seaworthy; one man control. Price low.



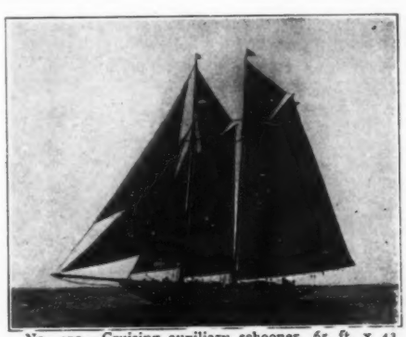
No. 639.—Latest type raised deck cruiser, 52 ft. x 48 ft. x 11 ft. x 4 ft.; built 1911; double stateroom, bath; sleeping accommodations for nine; Standard engine, speed 12 miles. Price reasonable. Charter considered.



No. 390.—Handsome thirty footer; 12 H. P. motor; built 1910. Price reasonable
Please mention MOTOR BOATING.



No. 591.—Attractive steel steam yacht, 94 ft. x 77 ft. x 14 ft. x 5 ft. 10 ins.; three staterooms; speed 14 miles; excellent condition throughout. Price extremely reasonable.



No. 472.—Cruising auxiliary schooner, 65 ft. x 43 ft. x 15 ft. x 9 ft.; built 1905; Craig engine 1909; Ratsey sails; inventory complete; excellent cabin accommodations; remarkably fast and able. Price very low.

No. 774.—35 ft. semi-speed launch; 25 H. P. motor, speed 16 miles. Located Maine. Bargain.
Please mention MOTOR BOATING.

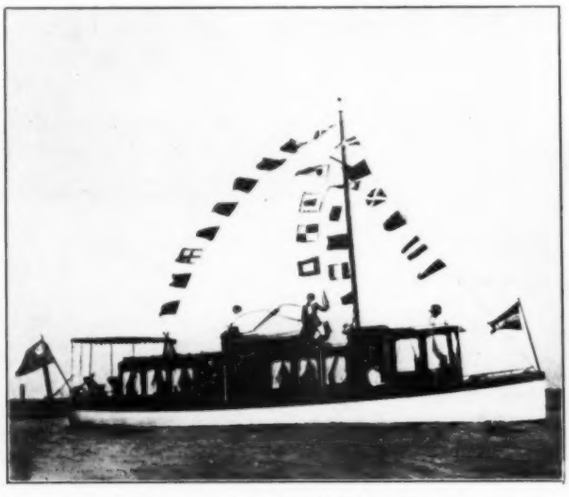
THE MOTOR BOATING MARKET PLACE

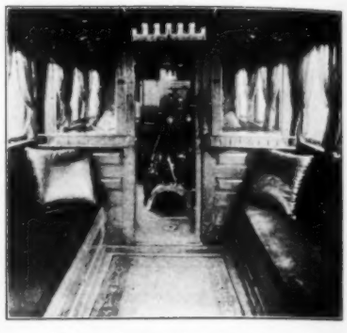
The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ inches deep, 1⅝ column wide..... $3
Cut three inches deep, three columns wide.....$10

Opportunities for the Motor Boatman

Before you buy or before you sell, examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MoToR BoatinG.

Section of owner's stateroom.



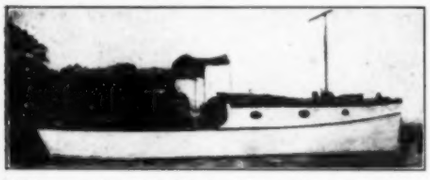


Section of saloon facing engine room.

DON'T purchase a boat until you have sent for description and photographs of this beautiful full cabin cruiser, the most elegantly appointed craft of her size on the Great Lakes. Thoroughly seaworthy. 45 x 9 ft. Speed ten miles. Sleeping accommodations for eight. Owner's stateroom with double berth and player piano. Large saloon with two double extension berths. Forty horsepower motor. Electric lighting. Auxiliary sail. Fully found. A rare bargain.
FRANK S. WINSLOW, 30 NORTH DEARBORN STREET, CHICAGO, ILL.

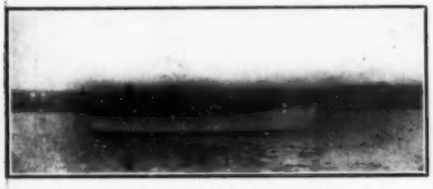
FOR SALE—GENTLEMAN'S HIGH SPEED RUNABOUT HULL.

40 ft., 4 ft. beam, ⅜ cedar lap-strake. Mahogany decks and trim. Natural finish throughout. Fully furnished. Auto top. Complete class 3 polished brass equipment. Built by Jacobs for millionaire yachtsman as racer. Has made 27 miles with 60 H. P. engine. Remodeled as tender. Now contains 2 C., 15 H. P. marine engine, giving about 14 miles, which may be retained until suitable engine is secured. Cost $3,500. Change of plans makes sale at less than one-third cost advisable. Seen by appointment at City Island. Address—letters only—H. E. Angell, Secretary, 5 East 42d Street, New York City.



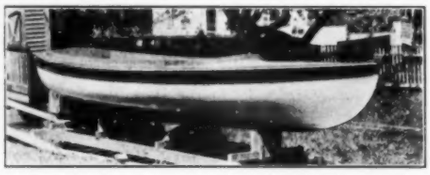
NO. 134.—For Sale—Think of it, 30 ft. x 7 ft. 6 in., finished in mahogany and white, 16 ft. cabin, 11 ft. cockpit, toilet, lavatory, 18 H. P. motor, paragon reverse, perfect condition, only $700. Apply to Boston Marine Agency, 15 School St., Boston, Mass.

No. 931.—Sale, charter; 63 feet; 10½ miles. Terms and particulars, Gielow & Orr, No. 52 Broadway, New York.



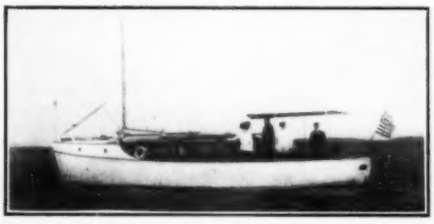
SPLENDID OPPORTUNITY.

Practically new 30 ft. Palmer Cabin Cruiser. Four cycle, 15 H. P. engine. Roomy cabin, extension berths, toilet, icebox, kitchenette, running water, large cockpit. F. W., care Motor Boating.

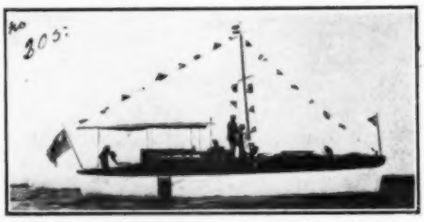


FOR SALE.—25 ft. x 6 ft. Whaleboat type, oak frame, ⅞ in. cedar planking, mahogany trimmings, brass fittings, 18 gallon tank, galvanized rudder, $300 F. O. B. Boston, without engine. John Barker, 283 Upland Road, Cambridge, Mass.

FOR SALE—40-ft. racer with 8-cylinder 250 horse-power motor. G. H., care of MOTOR BOATING.



NO. 217.—For Sale—Beautiful raised deck, half-sash cabin cruiser; 42 x 10; 4 cylinder Standard motor. Elegantly and completely equipped. Has cruised to Florida.



NO. 205.—For Sale—Elegant raised deck cruiser; 39 x 9; 4 cylinder Craig motor. All mahogany finish. Fully equipped.

NO. 208.—For Sale—To close estate, 71 x 13 deep sea cruiser. Modern boat, heavy construction, beautifully appointed. New 50 H. P. Standard motor. Sacrifice. RUDDOCK YACHT WORKS, BROKERAGE DEPT., 120 Liberty Street, New York City.

20 to 25 H. P., 4 cylinder, 4 cycle Continental marine motor. Weight 235. Fine for Speed boat. Perfect condition. Price $140. Bill Ferguson, 210 Jefferson St., Waterloo, Iowa.

AUTO MARINE MOTORS FOR SALE.

32-64	H. P., new, 4 cyl., 4 cycle	$475
25-50	H. P., new, 4 cyl., 4 cycle	345
23-47	H. P., new, 4 cyl., 4 cycle	285
20-40	H. P., new, 4 cyl., 4 cycle	285
14-28	H. P., new, 4 cyl., 4 cycle	205
44-88	H. P., new, 4 cyl., 2 cycle	275
33-66	H. P., new, 3 cyl., 2 cycle	225
22-44	H. P., new, 2 cyl., 2 cycle	200

Motors are complete with all accessories, including reverse gear and magneto, and are ready to run. Will ship on approval.
BILL FERGUSON, 210 Jefferson St., Waterloo, Iowa.

SCORED cylinders repaired, $12 each. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. Better investigate and save money. References, testimonials and full details on request. Waterbury Welding Company, Waterbury Conn.

USE "SNAPPER" ENGINES for your small boats. They are a big little engine built by The Automatic Machine Co., Bridgeport, Conn.

CANADIANS, Second-hand engine bargains. Send for list. Guarantee Motor Company, 73 Bay Street, North, Hamilton, Ont., Canada.

FOR SALE—Auto speed boat, 25 x 5. Thirty H. P. 4 cylinder engine, speed 20 miles; original cost $1,200, will sell for $500. Address W. S. S., care Motor Boating.

BARGAIN.—Classy Semi-Cruising, Semi-Speed Launch, Torpedo Stern, hull 35 x 6 ft. 6 in., Hunting cabin, 13 x 6 ft., toilet and folding mahogany and nickel lavatory, running water in separate room, large mahogany skylight, electric lights, lockers. Covered cockpit, 10 x 6 ft. (can be entirely enclosed), 27 H. P. 4 cylinder Lackawanna motor, Hydrex Silencer, Paragon reverse gear, control at wheel, Apple dynamo, storage battery, voltmeter, anchor, brass running lights, life preservers, flag poles, etc., 30-inch icebox. Good sea boat, four years' old, speed 10 miles. Cost over $2,800, will sell for $1,000 for a quick sale as owners unable to use. Can be seen 50 minutes from New York. Address P. O. Box 153, Elizabeth, N. J.

GREAT BARGAINS IN MOTORS.

24 H. P., 3¼ x 4½; 40 H. P., 4¼ x 5½, 4 cylinder, 4 cycle motors. Fully equipped. Bosch magneto. Stromberg or Schebler carburetor. Cork insert cone clutch. Fan. "Kirkham Timer." Two sets spark plugs. Thoroughly tested. Ready for business. Immediate delivery. One to ten. Marine or automobile.
KIRKHAM MOTOR MFG. CO., BATH, N. Y.

BRIDGE DECK CRUISER.

No. 183.—Beautifully built motor boat, 35 ft. x 8 ft. 6 in.; two cabins in oak and mahg.; sleep 8; hull used two seasons; engine new 1911; 25 H. P., 3 cyl.; all painted ready for water; complete inventory; the best money can buy; $2,000. Boston Marine Agency, 15 School St., Boston, Mass.

1—MacLachlan Single-Acting Compound Steam Engine, has two high pressure cylinders and two low pressure; 20 h. p. at 600 r. p. m. This engine is reversible under full load. It is in fine shape in every way and will make an ideal engine for a steam launch or dry cleaning plant. Price, $250.00. S. F. Bowser & Co., Inc., Fort Wayne, Ind.

FOR SALE—Bargain—Stillman and Truitt design (on heavy paper) for 26 ft. Speed Boat. Write for particulars. Wm. Holmquist, 6613 Green St., Chicago, Ill.

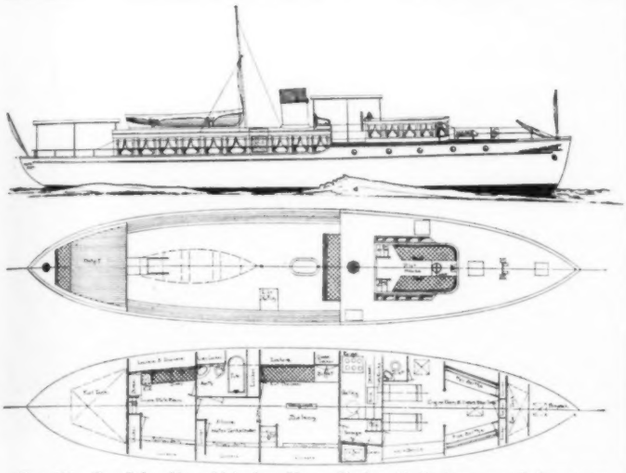
FOR SALE—Handsome 25 x 5 Auto Controlled Runabout. Speed, 15 miles per hour; $600. Photo on request. Weber, 595 West 178th St., N. Y. City.

THE MOTOR BOATING MARKET PLACE

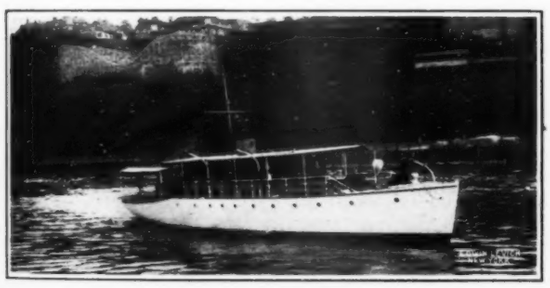
The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ ins. deep, 1⅝ column wide..... $3
Cut three inches deep, three columns wide..... $10

Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention Motor Boating.



No. 2666.—For Sale—Very high-class Motor Yacht. Built from our designs; completed this last November, and has had but 3 months' cruising in Florida. We are designing much larger yacht for owner, which is his reason for selling. Boat has given very best satisfaction, proving able, reliable, and an ideal cruiser for coast and Florida cruising. Dimensions—67 ft. length; 14 ft. beam; 3 ft. draft; twin screw; 2-40 H.P. Heavy Duty Sterling Engines. Most complete electric lighting plant; latest Edison batteries, elaborately furnished; 12 ft. motor tender and rowboat; very best of condition throughout; completely equipped for extensive cruising. Yacht will be sold in first-class running condition. Now in commission in New York. Blueprints and full particulars from Whittelsey & Whittelsey, No. 11 Broadway, N. Y. Tel.—Rector 4718.



SEA-GOING TWIN SCREW MOTOR YACHT.

Length overall ..... 90 ft. 0 in.
Beam ..... 16 ft. 0 in.
Draft ..... 4 ft. 6 in.
Speed ..... 16 miles per hour
Launched ..... May, 1911.

Designed and built by
GAS ENGINE & POWER CO.,
—and—
CHARLES L. SEABURY & CO., CONSOLIDATED.

Hull strong and substantially constructed, finished throughout in mahogany panelled.

Owners' and guests' quarters are very commodious, large double staterooms arranged to connect with toilet rooms.

Extra large dining saloon in deck house aft, has two berths, open fireplace; this deck house is also used as a music room, has piano; the galley is located aft of the dining-room.

The yacht is lighted throughout by electric lights; upholstered throughout in the finest manner possible.

Machinery, 2 6-cylinder, 8½ in. x 10 in. 150 H. P. "Speedway" engines, air starting and reversing, has independent electric lighting plant, bilge pump, air compressor for compressing air for starting the motors, gasoline tank of heavy copper braced in best possible manner, water tanks copper tinned, lined.

This yacht was designed and built for long cruises, with large gasoline and water tank capacity and very large locker rooms and stowage space, pilot house for steersman forward, with marine telegraphs to engine room.

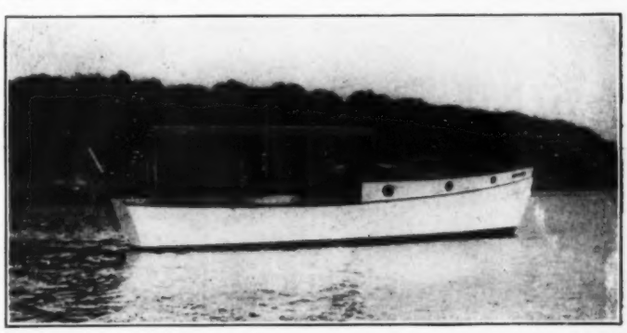
This is without doubt the finest cruising yacht ever built, yacht and machinery plant in excellent order throughout, subject to the closest inspection.

For further particulars apply to

GAS ENGINE & POWER CO. and CHARLES L. SEABURY CO., Morris Heights, N. Y. C.

No. 5518.—For Sale—Splendid opportunity. Keel sloop. Dimensions—52 ft. overall; 12 ft. beam; 7 ft. 6 in. draft; excellent condition throughout. Inventory: 2 suits sails, one being made and not yet delivered; dinghy on davits; anchors, awnings, shipmate range; completely furnished. Interior mahogany. Hull very heavy construction; copper riveted; decks finished natural. Price, $1,800. Inspectable by permit from Whittelsey & Whittelsey, 11 Broadway. Tel. Rector—4718.

Elco Express; 6-cylinder Peerless engine; makes a speed of 24 miles; well constructed; in perfect condition; used very little; practically new. A bargain for one desiring a high-class speed boat. Apply to F. W. Sewell, 1964 Broadway, New York City.



No. 6531.—For Sale—Raised deck cruiser, 28.6 x 7.6 x 2.6 feet. Fully equipped; 15 H. P. motor and high-tension magneto. May be seen within an hour's ride of the city. For further particulars apply, J. W. Straub, 243 Front Street, N. Y. City.

MAHOGANY BOAT FOR SALE

Solid mahogany. Length 28 ft. Beam, 5 ft, 6 in. Draft 20 in. 10 H. P. Vim motor.

Motor and boat in perfect condition. 3 yrs. old, used only 2 summers. To be sold at a low figure to close an estate.

Address, Box 427, NORTHAMPTON, MASS.

Dealers—Attention!
R. E. DIETZ COMPANY
are closing out their entire stock of
MARINE LAMPS
and are offering them at bare FACTORY COST. SOLID BRASS—FITTED WITH CORNING FRESNELS. An exceptional opportunity to buy high grade lamps at money making prices.
60 LAIGHT STREET NEW YORK CITY
WRITE QUICK FOR BARGAINS.

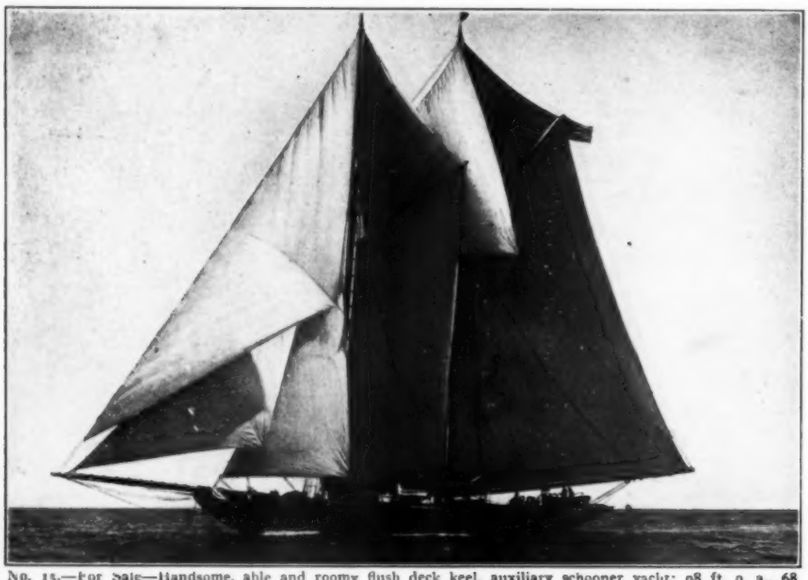
300 H. P. 1907 MODEL
STANDARD
Single Acting, Air Starting and Reversing. Good as new
$2800.00 Act Quick
BRUNS, KIMBALL & CO.
132 Liberty Street New York City

THE MOTOR BOATING MARKET PLACE

The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
Cut one inch deep, one column wide..... $2
Cut 1½ ins. deep, 1½ columns wide..... $3
Cut three inches deep, three columns wide..... $10

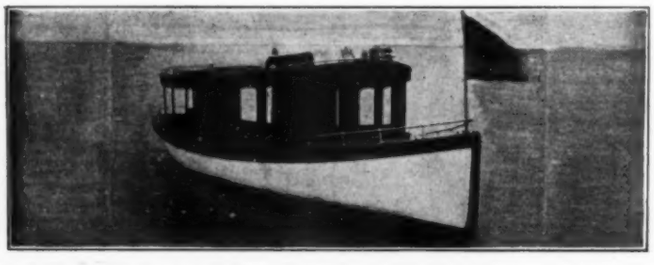
Opportunities for the Motor Boatman

Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention Motor Boating.

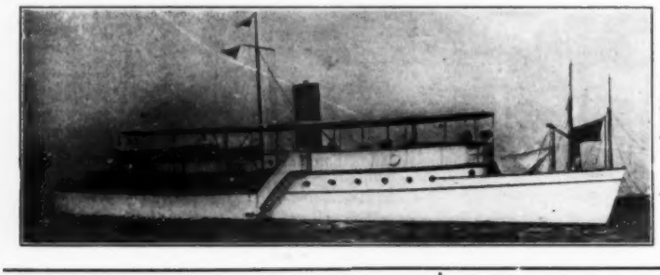


No. 15.—For Sale—Handsome, able and roomy flush deck keel, auxiliary schooner yacht; 98 ft. o. a., 68 ft. w. l., 20 ft. beam, 9 ft. draft. Recent build. One double and two single staterooms, large saloon, bathroom, two toilets, acetylene lights, etc. Speed under power 9 miles; 50-60 H. P. Standard motor (installed 1910). Handsomely finished and furnished. Price attractive. Apply to Cox & Stevens, 15 William St., New York.

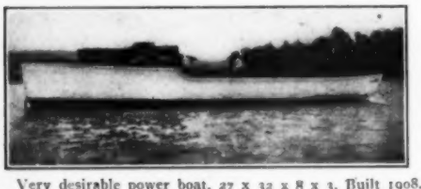
REDUCED TO $1250.00



ATTRACTIVE CABIN CRUISER, 36 x 8 ft.; copper riveted; fine sea boat; 21 H. P. 3 cylinder 2 cycle Kahlenberg engine; battery and magneto; starts automatically without cranking. Reversible engine; friction clutch; golden oak paneled cabin. Sand's closet and folding wash stand; leather cushions, brass lights, etc. Fully equipped and in perfect condition; copper fuel tank of 250 gallons; speed 10 miles per hour. Could not duplicate boat for $3,000. Now in Sturgeon Bay, Wis. Delivered within reasonable distance for $1,250.00. F. J. Cabot, 6995 Washington Ave., St. Louis, Mo.



No. 1406.—For Sale; 92-foot sea-going cruising yacht; 20th Century motor; best furnished and fitted yacht of her size on the coast. Gielow & Orr, No. 52 Broadway, New York.



Very desirable power boat, 27 x 32 x 8 x 3. Built 1908. 17 H. P. "Leader" engine, 2 cylinder, 4 cycle horizontal. Strongly built; cedar planking; mahogany trim; completely equipped. Has toilet, porcelain wash basin, large water tank, awning with canvas top and sides, cushions for cabin and cockpit. Will sell very reasonably. Apply owner, T. B. Bleecker, 236 Greenwich St., Phone 2960 Cortland.

FINE little high grade runabout. Hand "V"-Bottom type. 21 ft. x 4 ft. 8 in. 21 H. P. Ferro motor. Reverse gear, "Sireno" horn, top, etc. Bulkhead control. Best finish. Speed 16 miles. Seats six. Owner has slept aboard on week-end cruises. Complete inventory. One year old. Cheap for cash or might trade for cabin cruiser. Asking $225. Also Evinrude portable motor, $35. Trial allowed. Full particulars and photo from P. A. Messinger, 20-22 East Fayette St., Baltimore, Md.

1000 guaranteed pocket ammeters for testing batteries. Handsomely nickelplated. Each instrument in a chamois leather case, 25c postpaid. Stamps taken. Auto Repair Co., 521-23 West 144th St., New York.

FOR SALE: Open mahogany launch, built by Seabury, 30 x 6.8. Speedway motor, 16-20. Deck and trim mahogany. Splendid bargain for one desiring family boat. J. D. C., MOTOR BOATING.

BARGAINS IN NEW 1911 WISCONSIN SHOW MOTORS.
1-cyl., 7 H.P., $90; 2-cyl., 15 H.P., $150; 3-cyl., 27 H.P., $275; 4-cyl., 35 H.P., demonstrator, $280.
WISCONSIN MACHINERY & MFG. CO., Canal St., Milwaukee, Wis.

LET US FIND
the Yacht you want. Bargains any type, Power or Sail. Boston Marine Agency, 15 School St., Boston, Mass.

BUILD IT YOURSELF from our simplified V-bottom designs if you want 25 miles for the price of 12. MISSISSIPPI VALLEY POWER BOAT CO. 480 So. Wabasha St., St. Paul, Minn.

WE WILL PAY YOUR RAILROAD FARE TO DETROIT if you will buy one of our boats. Write us about this proposition. We have the largest and finest showroom in the world, exhibiting sixty-four styles of motor boats and a full line of rowboats and canoes. DETROIT BOAT CO., 1258 JEFFERSON, COR. BELLEVUE, DETROIT, MICH.

WELDING.
Cracked Cylinders and all Broken Castings in any Metal SECURELY Welded and GUARANTEED at about one-half the cost of a new part. NATIONAL Welding & Mfg. Co., Incorporated, 527 Jackson Boulvd, Chicago, Ill.

FOR SALE at reasonable price, one 300 H. P. six cylinder single acting reversible Standard engine. Has been in use one year and better than new. Reason for sale, am manufacturer of marine motors and am changing Standard for my own make. Also have one Standard lighting outfit in A1 shape. Will sell both together or separately as purchaser may require. W. E. SCRIPPS, SCRIPPS MOTOR CO., 631 Lincoln Ave., Detroit, Mich.

FOR SALE: 42-ft. raised deck cruiser, launched last July; one 30-footer, launched in 1909; one 30-footer, launched last June. These boats are in first-class order and are fitted with 4-cycle engines. Palmer Brothers, Cos Cob, Conn.

FOR SALE: 4 cylinder, 2 cycle, 20 H. P. second-hand marine motor, $100; 10 and 16 H. P. 2 cylinder, 2 cycle, *new*, with all accessories, $125, $150. George Brochu, 25 Cabot St., Holyoke, Mass.

NEW 54 H. P., six-cylinder Elbridge engine, just from factory. Aluminum manifolds, base and cylinder heads, extra finish throughout. Built for Mr. Coleman du Pont of Wilmington, Del.; exchanged for a larger power. Price $700. Emerson Engine Co., Alexandria, Va.

BROKEN cylinders and other automobile parts of cast iron and aluminum made good as new by autogenous welding at about one-fourth cost of new ones. Shipment made within 24 hours from arrival. Guarantee, references and indisputable evidence for the asking. Waterbury Welding Works, Waterbury, Conn.

FOR SALE—18 x 4½ runabout, 2 cycle, 2 cylinder engine, 6 to 7 H. P., 11 to 12 miles, auto top, everything complete. This is a first-class outfit and commands everyone's admiration. Will repaint and varnish and refinish complete. Write for price at once. Albert L. Lutz, 129 S. 3rd St., Burlington, Iowa.

WANT to correspond with boat builder that understands marine engines. Will give half interest in business to run this resort. Must be reliable and sober. E. Guillot, Helena, Mont.

FOR SALE AND CHARTER—Sail and motor boats of all types, suitable for the Great South Bay. Frank M. Weeks, 272 River Ave., Patchogue, L. I.

BARGAINS in Palmer motors, factory rebuilt and guaranteed. E. E. Palmer, 31 East 21st St., City.

EXTRA BARGAIN
Complete Frame and all materials to finish 26 ft. Racer, Niagara 1912 Model. *I have not received* material from the Niagara Co., but am unable to build boat and must dispose of same. I paid $125; will sell for $75 cash. J. Chandler, Care American Bridge Co., Toledo, Ohio.

BARGAINS—18 H. P., 2 cyl., Heavy Duty Buffalo Engine, $425; slightly used, full equipment. 21 H. P. 3 cyl., 1909 Gray, complete, $175. Reverse gear, will hold up to 30 H. P., $20. New 1¼ in. Krice Carburetor, $5. Charles Bimbo, 872 Lowe St., Appleton, Wis.

1—Roberts Marine Motor, Model 4M, 20 h. p., at 900 r. p. m. This is a 4-cylinder, 2-cycle engine; bore, 4 in.; stroke, 3½ in.; equipped with mechanical force feed oiler and is in A1 shape in every way. It weighs about 375 pounds. Four-coil ignition outfit. Price, $250.00. S. F. Bowser & Co., Inc., Fort Wayne, Ind.

AUXILIARY cat, 26 x 9½, fine, able cruiser, comfortable and well built, $450. W. J. Armstrong, 2849 Bainbridge Ave., Bronx, N. Y.

16 Ft. x 4 ft. 4 in. boat; best construction; brass screws fastened throughout; beautifully finished oak decks; large stern seat, leather upholstered back, cushions, etc.; 3½ H. P. engine and reverse gear, bronze shaft and propeller; used six months; in perfect condition; wonderfully seaworthy; speed 8½ miles; will sell quickly for $175 cash; am building speed boat. B. S. Stewart, 1411 Chicago Ave., Evanston, Ill.

FOR SALE—10 brand new Goshen marine engines at less than cost. State H. P. wanted. L. E. Thrig, Goshen, Ind.

LAUNCH for sale, 19 ft. long, 5 ft. beam, half cabin, 5 plate glass windows, 6 h. p. Lathrop engine, magnetc; a bargain, $300. C. J. Radcliffe, Shelton, Conn.

BUYERS OR SELLERS—Small craft of any description fetched or delivered anywhere under sail, power, or towed. Captain Pearson, Great Kills, Staten Island, N. Y.

NAVAL ARCHITECTS & YACHT BROKERS

ARTHUR BINNEY
Successor to EDWARD BURGESS
NAVAL ARCHITECT AND YACHT BROKER
Mason Building, 70 Kilby Street, Boston, Mass.
Agent for The Standard Marine Motor, The Commercial Acetylene Co. (Safety Storage System.)
TELEPHONES:
Office, 3795, Main. Residence, 3023-3, Brookline.
YACHT BROKERAGE DEPARTMENT:
Commission on Sales, 5 per Cent. Commission on Charters, 10 per Cent.

BOWES & MOWER
Naval Architects and Engineers
Yacht and Vessel Brokers
Offices, Lafayette Bldg., Chestnut and Fifth Streets
Bell Phone PHILADELPHIA, PA. Cable Bomo

BREESE & BREESE
Designers and Builders
Motor Boats and Gas Engines
HYDROPLANES
38 East 23rd St., New York City

NEW YORK JERSEY CITY BAYONNE
BRUNS KIMBALL & CO., Inc.
132 Liberty St., New York Phone, 2614 Rector
THE LARGEST and MOST RELIABLE MARINE AGENTS and YACHT BROKERS
Send for bargain list of first-class second hand engines or boats
Engine Installing : : Yacht Repairing

COX & STEVENS
Engineers and Naval Architects,
Yacht Brokers
15 WILLIAM STREET NEW YORK CITY
Telephone 1375 Broad

JAMES CRAIG
907-941 Garfield Ave. Jersey City, N. J.
Tel. 2237 Bergen.
DESIGNER AND CONSTRUCTOR OF MARINE GASOLINE ENGINES AND SPECIAL MECHANISMS, SEVEN TO THREE HUNDRED HORSEPOWER

DOWNEY SHIPYARD & MARINE COMPANY
Yachts, Steam or Sail, and Motor Boats
Built, Repaired, Bought, Sold, Chartered
SHIPYARD, Marine Construction and Repair Dept.,
23rd and 24th Streets and 3rd Ave., Brooklyn, N. Y.
NEW YORK OFFICE, 30 CHURCH STREET
Cable Address, "Downeyard," New York

The Eastern Marine Motor Sales Co.
Plant Foot Bay, 44th St. BROOKLYN
Office 136 Liberty St. NEW YORK
Designers and Builders of Real Boats

GIELOW & ORR
Naval Architects, Engineers and Brokers
Marine Insurance
82 BROADWAY, NEW YORK, N. Y.
Telephone 6078 Broad
Plans, Specifications and Estimates furnished for all requirements
Descriptions and Photos submitted upon receipt of inquiry.

Plans II"—The most successful 21 footer.—Speed, Seaworthiness, Comfort and Simplicity. Amateurs can build my original "V" bottom boats. Send stamp for illustrated circular of designs.
WILLIAM H. HAND, JR., Naval Architect, New Bedford, Mass.

Yard and Shop.

(*Continued from page 52.*)

A Good Thing to Take on a Cruise.

When the sea is too rough outside to start on the day's run, when a steady rain makes a cosy cabin highly preferable to a wet trick at the wheel, or when a warm afternoon, smooth water and someone else to steer makes a pipe and a good story the only things lacking for a heavenly loaf, then *From the Car Behind*, by Eleanor M. Ingram is just the book to fill the want. No motor enthusiast can read the vivid story of the Vanderbilt race in the sixteenth chapter without a sympathetic thrill and even if that chapter were not in the book at all, the tale of how young "Corrie" Rose, the millionaire's son, stuck to his ideal of honor and shielded the woman whose cowardice had brought unmerited disgrace upon him and of how Allan Gerard, the racing driver, whose injuries Rose was supposed to have caused, stuck by him and helped to make him a man, would make the story well worth while. *From the Car Behind* is published by the J. B. Lippincott Company, at $1.25 net.

A Motor for Speed Boats.

The Sturtevant Mfg. Company have placed on the market through the B. F. Sturtevant Co., Hyde Park, Boston, Mass., a four-cycle gasoline motor in four and six-cylinder sizes, suitable for use in speed craft. The cylinders are of the L-type with exhaust and intake valves on the same side. Water-jackets are cast integral. The base is an aluminum casting, designed with an eye to strength and rigidity rather than extreme lightness. The oil pan, also of aluminum, is very light and so constructed that neither the forward nor rear cylinders are over-lubricated, no matter what angle the motor may take. Cylinders are 4½ x 4½ inches. The four-cylinder size develops 40 h.p. at 1,200 r.p.m. and weighs, complete, 200 lbs., and the six-cylinder size has a total weight of 285 lbs. and delivers 60 h.p. at 1,200 r.p.m. The B. F. Sturtevant Company recently conducted some interesting tests of both the four and six-cylinder motors direct connected to a dynamometer. A comparison of the rated and actual horsepower of these motors is shown by the following table:

4-CYLINDER 4½" BORE X 4½" STROKE.		
A. L. A. M. Rating	1332 r.p.m.	equals 32 h.p.
Actual Performance	1332 r.p.m.	" 50 h.p.
6-CYLINDER 4½" BORE X 4½" STROKE.		
A. L. A. M Rating	1332 r.p.m.	equals 48 h.p.
Actual Performance	1332 r.p.m.	" 76 h.p.

Barber Three-Port Motors.

Barber Bros., of Syracuse, N. Y., are turning out a good line of two-cycle engines of the three-port type for marine service. These motors are made in 2½, 4, 6, 9 and 12 h.p. sizes with one cylinder; 5, 8, 12, 18, 24 and 40 h.p. sizes with two cylinders; 8, 12, 18, 27, 36 and 60 h.p. sizes with three cylinders and a special high-speed, light-weight, three-cylinder machine for semi-speed and racing boats. While Barber engines may be a little higher in price than some other makes, the difference is fully made up by the fact that they are conservatively rated and will positively deliver the full horsepower expected of them. Extra large hand-hole plates are fitted to the crankcase and the cylinder heads are separate from the cylinders and can be easily removed for the examination of the piston. The jump-spark type of ignition is used and a combination timer and distributer is furnished of the manufacturer's own design which is mounted on the forward cylinder and driven by gears from the crankshaft. The equipment includes propeller shaft, bronze propeller wheel and stuffing-box, electrical apparatus, etc.

The Vim Non-Backfiring Device.

The Vim Motor Company, Sandusky, Ohio, manufacturers of the Vim marine motor, have embodied in their 1912 product a device which they claim will positively guard against backfiring and base explosions. The device is built on the principle of a miner's safety lamp. Wire gauze screens are placed in the by-pass port, through which it is impossible for a flame

(*Continued on page 72.*)

NAVAL ARCHITECTS & YACHT BROKERS

BATH KNOCK DOWN BOATS
HOMER
159 State Street BOSTON

KROGMAN & PURDY
Yacht and Ship Brokers
HIGH GRADE YACHTS OF ALL TYPES FOR SALE AND CHARTER
92 State Street, Boston, Mass.
Correspondence Invited Particulars Furnished

GEO. H. MILLER & CO.
Launch and Yacht Builders
PATCHOGUE, N. Y.
Get Our Estimate Now.

WM. W. MILLER
Yacht Designer and Builder
MARINE RAILWAY
STORAGE REPAIRS
River Street, CHARLOTTE, N. Y.

FREDERIC S. NOCK
NAVAL ARCHITECT AND YACHT BUILDER
MARINE RAILWAYS, STORAGE, REPAIRS
EAST GREENWICH RHODE ISLAND

BROKERAGE DEPARTMENT
OF THE
W. F. Ruddock Boat and Yacht Works
Yard & Works, 213-214th Sts. & Harlem River
120 Liberty St., N. Y. City
'PHONE 4536 RECTOR
OUR Brokerage Department facilities enable buyers to choose from a most complete list of high grade pleasure and commercial vessels of recent build, at remarkably low prices. We can fill your requirements no matter what they may be.
Repairing - NAVAL ARCHITECTURE - Winter Storage - Insurance

Get Wise to Good Boat Building
WRITE FOR CIRCULAR
UNITED BOAT CO.
926 COURT ST, SYRACUSE, N. Y.

Tel. Lombard 2389 Cable Add. "Murwat"
J. MURRAY WATTS
Naval Architects and Engineers Yacht and Vessel Brokers
Offices: 827-828 BROWN BROS. BUILDING
320 CHESTNUT STREET PHILADELPHIA

THEODORE D. WELLS
Naval Architect and Marine Engineer
32 Broadway, New York. Tel. Broad 6737
A Specialty of Steam Yachts, Power Boats and Sailing Yachts.
Successor to H. G. WINTRINGHAM and WINTRINGHAM AND WELLS.

NOTICE
After May 1, 1912, address
MORRIS M. WHITAKER
Naval Architect
At UPPER NYACK, N. Y.

Mostly Weather

TRADE MARK.

For your spars and decks, where it is mostly a question of withstanding weather conditions, the best results are obtained by using a varnish with good body, light in colo , free working, elastic, most durable, brilliant and that dries out of the way of injury from dust in about eight hours. Many, very many of the most experienced designers, builders and owners use and recommend

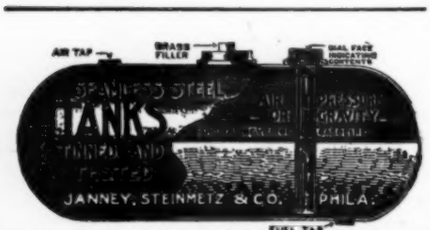
EDWARD SMITH'S SPAR COATING

For wood or metal work awash most of the time and where it is a question of "mostly water" use Edward Smith's heavy bodied and quick drying

QUICK MARINE COATING

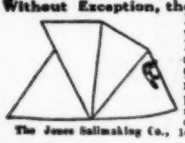
It is perfectly adapted to all places where the Spar Coating is suitable, but is particularly recommended where quick drying qualities are first consideration. Dries dust free in three to five hours. Will not turn white under water.

Edward Smith & Company
"Varnish Makers for 85 Years"
West Ave., 6th and 7th Sts., Long Island City
P. O. Box 1780, New York City
Western Branch, 3532-34 S. Morgan Street, Chicago



New York Office: Hudson Terminal Bldg., 30 Church Street

JONES SPRAY HOODS
Without Exception, the Finest Hoods Manufactured



Made of strong brass tubing covered with best waterproof Gov't. Khaki. Polished brass fittings. Bows work on hinges fastened to coaming. Quickest to put up and down. Folds neatly over forward coaming. Fit perfectly because every hood is made to order. Several Styles. Don't buy elsewhere before writing us for prices.

The Jones Sailmaking Co., 149 Huguenot St., New Rochelle, N. Y.

Yard and Shop.

(*Continued from page 71.*)

from the firing chamber, which would ignite the gases in the base, to pass. The Vim Motor Company claim that it is impossible with this attachment to make a Vim motor back-fire no matter how much the speed may be varied.

New Departure 1912 Catalogue.

The new 1912 catalogue of the New Departure Mfg. Company, Bristol, Conn., is now ready for distribution. It contains much valuable engineering data, useful for mechanical or designing engineers, purchasing agents and manufacturers and, with its colored charts, tables, etc., can really be dignified with the name of a treatise on the subject of ball bearings. Naturally the types treated at greatest length are the New Departure "Radax," a bearing designed to take both radial loads and thrust in one direction, the single row bearings for strictly radial loads where the axial load or end thrust is a negligible quantity and the double row combined radial and thrust bearing, which can successfully resist radial and thrust stresses from any direction without appreciable friction and with equal efficiency. The New Departure Company aims to cooperate with its customers by offering without cost the services of a skilled staff of mechanical engineers who are trained to give practical advice and assistance on the subject of anti-friction bearings.

The Charm of Amateur Boat Building.

One of the most interesting branches of the boat building business which has appeared within the last few years, is the manufacture of various styles of craft ready for assembly by an amateur builder. A prominent figure in this branch of the industry is the Brooks Mfg. Company, of Saginaw, Mich. Numbers of their boats have been built in all parts of the country where a motor boat can be used by men with no more mechanical ability or skill than was necessary to handle a hammer, saw and screw-driver. The company employs three different methods: By the first, all parts of the boat, including frames, planking, fittings and hardware together with the plans and complete instructions, are shipped to the purchaser and all he has to do is to fit them together. By the second method, only the frames are furnished, ready shaped and fitted, and the purchaser buys his own planking and finishing lumber locally. The third plan is simply to furnish the full-sized patterns and instructions and permit the amateur to buy and shape all his own material. The completeness of the plans and illustrations, showing every step in the construction of the boat, enable the amateur to turn out a craft which it would be hard to tell from the product of the experienced boat builder. In fact, many professional boat builders are using these plans and patterns. While many patrons of the company have been attracted to the plan by the opportunity it offers to get a good boat at a great reduction from the regular builders' prices, a great number were fascinated by the enjoyment and recreation to be gained from the work itself.

Michigan Wheel Much in Demand.

The Michigan Wheel Company, of Grand Rapids, Mich., makers of the Michigan racing, towing, weedless and reversible propeller wheels, as well as reverse gears and all types of motor boat accessories, report that orders are being received in such large numbers that they have been compelled to double their working force in order to keep up with their established policy of making shipment the same day the order is received.

Baltimore Show Postponed Until Next Year.

The motor boat show which was to have been held from April 3rd to 13th at Baltimore, Md., has been postponed until 1913. While enough was accomplished to make it evident that the proposition was favorably received by the manufacturers, it was found that the time was too limited to make the exhibition the success that was desired, besides which it was felt that the proposed dates were too late in the season to suit the convenience of the makers. The Baltimore Marine Engine & Motor Boat Exhibition Company has been organized with H. A. Brehm as president; S. Regester, secretary and treasurer, and Geo. H. Knöchel, manager, to make the arrangements for the 1913 show. Headquarters are at 417 East Baltimore Street, Baltimore, Md.

(*Continued on page 74.*)

AUTO SAFETY REAR STARTER

Patents Pending.

Cranks your marine motor like an automobile, but without possibility of a back-kick. When motor back-fires, the crank handle is not affected. The chain and sprocket reduction makes it very easy to turn the motor over.

The Auto Safety Rear Starter is a perfect mechanism. Adjustable stand makes it possible to arrange crank at any desired height above engine shaft. Readily applied to any size or style of engine. Can be mounted upon bulkhead instead of stand if preferred.

Write today for information and prices.

AUTO SAFETY CRANK CO.
HOLYOKE, MASS.
MFD. ONLY BY B. F. PERKINS & SON, INC.

SPARK COILS

For Marine and Stationary Engines

Get our circulars and prices—They're interesting!

DETROIT COIL CO.
45 Fort St. East Detroit, Mich.

Fahnestock Spring Binding Post

Grips the wire by action of a spring. Positive contact. You have seen them on Columbia dry batteries. We make 20 different sizes and shapes.

Send 50c. for box of one dozen assorted sizes. Use them on your spark plugs and ignition wires. Send for our circular. free.

FAHNESTOCK ELECTRIC CO.
129 Patchen Ave. Brooklyn, N. Y.

HALL ENGINES

First to Havana.
First to Key West.
First to Atlantic City.

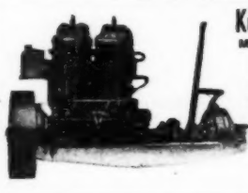
8600 miles at full speed in rough weather, under all conditions of climate and elements. Winning Four Cups out of Five. Winner of Greatest Race of 1909, Bermuda to New York. Winner National Championship and Challenge Race of New York in 1909. Winner of every race entered in cruiser class in United States in 1909. Holds world's record for hours run and revolutions turned with full load on engine. One to six cylinders.

Send for Literature Today

HALL GAS ENGINE CO., Bridesburg, Philadelphia, Pa.
Southern Representative, Capt. ELI WINTER
24 East State Street. AGENTS WANTED Savannah, Ga.
NEW YORK OFFICE, 50 Church St., Hudson Terminal

STA-RITE Spark Plugs have Stayed Right the Longest for Nine Years. Repaired Free Perpetually

PRICE $1.00 NET for 5c Return Postage.
The R. E. HARDY Co., (Inc. 1900)
1134 Austin Avenue, Cor. May St., Chicago



Kerosene Oil Engine

Marine, Stationary, Portable

NO DANGER, Maximum Power, Lightest Weight. Simple, Reliable, Economical. No Batteries. Self ignition. Low Compression. Fully guaranteed. Write for Catalogue. B. ☞ No charge for packing.

HATCH OIL ENGINE CO.
39th Ave. & 18th St.
Brooklyn, N. Y.

CAMERAS and Camera Supplies

Catalogue Free

Herbert & Huesgen Co.
311 Madison Ave.
Room 16 New York City

VALENTINE'S VALSPAR

"The Varnish That Won't Turn White"

This boat's hull is varnished with Valspar. The spray soaks the varnish from stem to stern, the water dries off in the sun and the Valspar emerges after every wetting bright and clear and lustrous and new-looking.

This boat is the "Vita," winner of the Southern and Long Island Sound Championships. Its owner, Rear Commodore J. Stuart Blackton, of the Motor Boat Club of America, writes:

> "I have used Valspar for two seasons and find it the only varnish that does not turn milky in salt water."

Salt water doesn't hurt Valspar. Neither does fresh.

When other varnishes are turning cloudy and white and losing all their lustre, Valspar stays on the job and smiles in the sun as brightly as when put on.

Your boat, be it a motor boat, sailboat, launch, dinghy or canoe, will stay bright in water, if you varnish it with Valspar.

Send for the proof of Valspar's superiority for floors. We have it.

A book full of just the information you need about varnishes (including all the tricks of using varnish effectively) will turn up in your mail promptly if you use that coupon before we give your copy to someone else.

VALENTINE & COMPANY

456 Fourth Avenue, New York City

TRADE VALENTINES VARNISHES MARK.

Chicago Boston Toronto
London Paris Amsterdam

FILL IN—TEAR OFF—MAIL TO-DAY

VALENTINE & COMPANY, 456 Fourth Ave., N. Y. (M.B.-5)

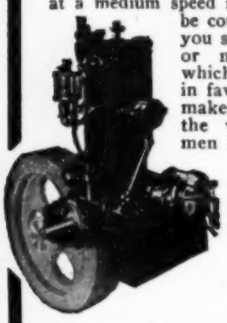
Name.....

Address.....

Send me, free of cost, a sample of Valspar and materials for a real test.

THE ROYAL ENGINE

When you get a Royal Engine you get an engine that is made for constant service and for hard wear—for the ordinary boat. An engine running at a medium speed revolution that can be counted upon to give you service always, day or night; an engine which is daily growing in favor with men who make their living on the water, and these men know.



You should know all the details of this carefully constructed motor.

Write for catalogue today

THE ROYAL ENGINE CO.
1050 Broad St. Bridgeport, Conn.

Good Agents Wanted Everywhere

Install one of our **Simplex Closets** in your boat. Can be used above or below water line.

Price, only $30.00 each

MARINE HARDWARE CO. Peabody, Mass.

THE STAR AIR AND WATER PUMPS

Send for catalogue

W. & J. TIEBOUT
MARINE HARDWARE
No. 118 Chambers Street
NEW YORK

Send 4 cents postage for Marine Catalogue

FREE

Complete 1912 Catalogue Showing Seven Types of

Solid Wheels, Sintz Timers

and the Celebrated

Sintz Reversing Propellers

500% more sold at show this year than last. There is a reason. It adds no weight, takes up very little room, gives maximum speed, perfect strength, and absolute control. Catalogue?

EAST. MOTOR SALES CO., 136 Liberty St., N. Y., East. Agents
WILMARTH & MORMAN CO., 1189 Monroe Ave. Grand Rapids, Mich.

TRADE LITERATURE.

THE DEAN MANUFACTURING COMPANY, Newport, Ky. Catalogue of Fox motors. Descriptions, illustrations and prices of the Fox line of marine, aero and stationary engines. It contains also a list of engine accessories.

THE VIXON TOOL COMPANY, 5001 Lancaster Avenue, Philadelphia, Pa. Bulletin B of Viven Files, illustrating files for all purposes and related tools.

THE REGAL GASOLINE ENGINE COMPANY, Coldwater, Mich. Catalogue of Regal Engines. This handsome and elaborately gotten up catalogue is issued in two forms. While both of these contain the same subject matter, one is embellished with an embossed cover and tinted borders and with its many illustrations presents the product of the Regal Company in a very attractive form.

THE RIPPLEY STEEL BOAT COMPANY, Grafton, Ill. Circular of complete motor boats and cruisers, besides steel hulls, set up ready for woodwork, knockdown hulls and sectional hulls.

THE LOCKWOOD-ASH MOTOR CO., Jackson, Mich. Catalogue of Marine motors for 1912. A clear, concise and attractive presentation of the marine engines made by the company. L-A motors are built in 2½ h.p. and 4 h.p. single-cylinder, 6 h.p., 8 h.p. and 12 h. p. double-cylinder, and 7½ h.p. and 18 h.p. three-cylinder sizes. There is also a 25 h.p. four-cylinder model.

Bulkhead Contol Up-to-Date.

(*Continued from page 23*)

"on" and it generally happens that one is "off" due to the fact that the engine was stopped by turning off the switch at the bulkhead and later throwing off the switch near the engine. This is not detected until after several unsuccessful attempts have been made to "get a spark" and then we remember we have forgotten one of the switches. Instead of providing the usual type of single or double pole switches for this work, two 3-way snap switches will be found much more convenient and can be placed at any desired points the same as the common type used. Turning either one of the two switches will stop the engine and then to start again, turning either will complete the circuit, it making no difference whether it was the switch used to stop the engine or the other one. Thus the helmsman could turn his switch to stop and the engineer turn his when ready to start.

For the lighting circuits these 3-way switches are also very handy. For instance at night a light is often wanted to see by until you are safe in your dinghy ready to row ashore and the switch should be handy to turn out lights on leaving. The next time you wish the light you will probably be in the engine room and by turning the 3-way switch there the circuit will be completed through the cockpit switch without closing it. The sketches show the wiring plans.

One of the most interesting, if not the most valuable, pieces of apparatus that helps in making a strictly "one-man boat" and keeps the helmsman posted as to the proper running of his engine or the speed of his boat through the water is the speed indicator, now generally accepted as a necessity.

The two types of speed indicators that are most commonly used to-day are those that indicate either the revolutions of the shaft or the speed of the boat through the water; one being a measure of the performance of the engine while the latter, although not independent of the former, gives to a large extent an indication of the effect of various loads and displacements and condition of the hull on the boat's speed. Of the first type the one with the flexible shaft is well known, but the electric speed indicator, or tachometer as it is called, is also popular. This is a very ingenuous device and depends upon the well-known law that the electro motive force generated by a magneto or dynamo is proportional to the revolutions. In other words, a voltmeter connected to the dynamo can be calibrated in terms of revolutions per minute instead of volts and will be a measure of the speed of the dynamo, which in this case is geared to the propeller shaft and consequently must turn at a rate proportional to the shaft's speed.

The other type of speed indicator resembles a steam gauge in appearance and connection is made from the gauge through a small metal tube to the outside of the planking a few inches below the water line, where the tube is bent, so that its opening will be in the direction that the boat is sailing.

Boats for Every Requirement

Complete Cabin Boats, Tugs and Commercial Boats of all kinds—Speed Boats, Special Shallow Draft Boats, Passenger Boats, Open Motor Boats, Rowboats and Canoes.

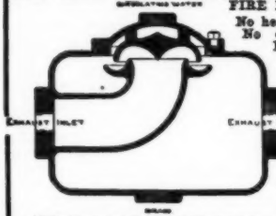
WRITE TO-DAY FOR CATALOG

RACINE BOAT COMPANY
1615 RACINE STREET
RACINE, WISCONSIN, U. S. A.

Chicago Show Room 1508 Michigan Avenue

Standard Thermex

STOP THAT NOISE. DON'T SUFFOCATE. AVOID FIRE RISK.



No heat, no odor. No clogging, no salt. No back pressure. Water cannot flow back to cylinder. Revolutions increased. Least possible noise. Insist upon the Thermex in the engine equipment when buying. Two or four cycle. Takes place of Muffler. Never wears out.

THERMEX SILENCER WORKS,
10 Lewis St., E. Boston, Mass., and
Our New Coast Representative is: MILO A. BRYTE, 788 Mission St., San Francisco, California.
BRUCE STEWART & CO., Charlottetown, P. E. I.

20-FT. SPECIAL $275.00

The best boat and engine outfit ever offered for $275.00.

20-ft. Fast Runabout
Speed 12 miles
$275.00

Write now for descriptive booklet.

Rice Brother Co.
Dept. B
East Boothbay, Me.
U. S. A.

A COMPLETE LINE
All Styles and Kinds Knocked Down
Sectional and Complete

Motor Boats, Barges, Ferries, Skiffs, Hunting Boats. Made Entirely of Galvanized Steel, Steel Ribs, Keel, Bow Stem, Side Plates. No Parts to Rot, Warp, Sun Check. 100 Per Cent. Stronger and Better than other boats.

Any Model, Sizes 14 to 75 ft.
Build your own boats, save 50 per cent. of cost.
Boat catalogue free.
RIPPLEY STEEL BOAT CO., Grafton, Ill., U. S. A. Box 100

Spray Hoods Should Be STANDARD Government Khaki

We make Spray Hoods of standard weight Khaki absolutely waterproof. Frames of brass tubing or stout, second-growth ash—cut and made to fit your boat. Complete, ready to attach. The cheapest hoods on the market, considering quality.

GET OUR CATALOG

It shows our full line of hoods and aprons, also Pneumatic Mattresses and Cushions and Acme floss filled or cork filled cushions that pass the requirements of the New Law. Government Inspected Life Preservers, Mooring Buoys, Canvas Fenders, etc. Write today for Catalog M.

PNEUMATIC MFG. CO., 526 17th Street, Brooklyn, N. Y.

WILLIAM E. THOMAS & CO.

SPRAY HOODS

Brass Frames and Fittings covered with government khaki duck. The best hoods on the market. Send for prices and catalogue

42 South Street, NEW YORK, N. Y. Telephone 1613 Broad

Best of All,

HUNTER WHISKEY HIGH-BALL

Sold at all first-class cafés and by jobbers.
WM. LANAHAN & SON, Baltimore, Md.

Minutes mean money!

Ferrymen — Fishermen — Supplymen — and other commercial boat owners lose hundreds of dollars yearly by not being able to *get there* on time. The fault lies in the cheap, stock motors used. Equip *your* boat with the surest, most powerful motor you can buy—

The DOMAN MARINE MOTOR

—and increase your present capacity 30 to 50 per cent. Domans are made for all boats—pleasure or commercial. Medium Duty type in 6, 9, 10, 12, 15, 20 H.P.—High Speed, 25-35, 45-50, 55-75 H.P.—Heavy Duty, 16, 24, 32, 40, 60 H.P. You can't fail to find one that just fits your case. Thousands in all parts of the country never knew the full possibilities of motor delivery till they installed a Doman.

If you really want to know—

"Why a Doman? Ask an Owner!"

You have a catalog coming

showing the complete line of Domans with those newer improvements you've read about. It's a catalog worth having—*where shall we send it?*

H. C. DOMAN CO.
Dept. C, Oshkosh, Wisconsin.
New York Seattle
Washington.

ROCHESTER MARINE STEERERS

The Auto Type

For speed boats and runabouts. It is equipped with 17" mahogany wheel—reinforced aluminum spider and mahogany drum. The column is polished brass, which we will furnish any length. Engine Controls of the latest automobile type are used on all models—centered within the wheel.

AUTO TYPE $15.00

CRUISER TYPE $20.00

Cruiser Type

It is built exceptionally strong and with long bearings—18-inch mahogany wheel with brass spider. We build this model with rope guides, to insure the tiller rope leading fair on the drum.

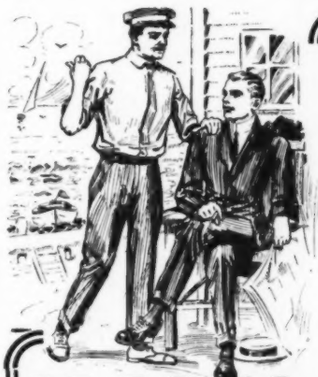
Prominent Naval Architects specify

ROCHESTER STEERERS

We guarantee our wheels to be built as strong and handsome as the finest Automobile wheels.

Write for literature.

Hall-Gibson Co.
63 Clinton Street
Rochester, N. Y.



HUSTLE OUT and see my new Kahlenberg

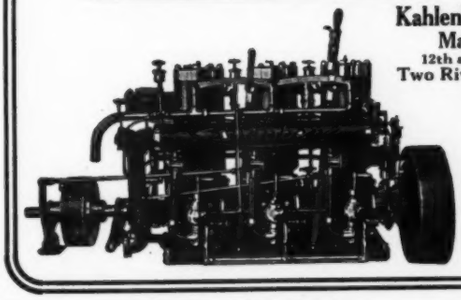
He's had one before—this new one works just as smoothly as the first. No wonder he wants his motor-boat friends to watch it hum. There are hundreds as enthusiastic as he. Read this:

Gentlemen:—After this, the second season, I am glad to state that your engine is perfectly satisfactory. We have had no trouble at all in these two seasons. Have seen no other engine that is as sure to keep on running as your 27 H. P. in my cruising launch. John Thielen.

Kahlenberg MARINE MOTOR

is the one you should install in your boat. It burns cheap fuel. It's easy to handle; starts without cranking; reverses from full speed ahead to full speed astern without gear and slows down gradually like a steam engine; has *one lever* throttle control which reduces fuel consumption 50% with but 10% reduction in speed of boat. Parts are standardized, accessible and quickly removed. Made in sizes 2 to 75 H. P. We have a catalog waiting for you. When shall we send it?

Continuous EFFICIENCY Guaranteed



Kahlenberg Bros. Co.
Manufacturers
12th and Monroe Sts.
Two Rivers, Wis. U. S. A.

Chicago Show Room
1508 Michigan Ave.

Seattle Show Rooms
514-516 First Ave. So.

Boston Show Room
382 Atlantic Ave.

Portland Show Room
47 Front St.

News for the Man with a Marine Engine

Install a **Baldridge Reverse Gear** in your boat (between engine and propeller)—and you will increase a hundred-fold the pleasures you find in motor boating.

Simply by moving a single lever you can guide your boat at will, run up to the dock, pick up a mooring, stop, go ahead, reverse (at full speed in emergencies)—all without stopping your engine.

Don't buy or use a motor boat without a *"Baldridge,"* if you value your safety and comfort. Nearly 12,000 joyful users praise the reliable "Baldridge."

If not at your dealer's send for **FREE BOOK.** Interesting from cover to cover.

The Baldridge Gear Company

Formerly Smith & Baldridge Machine Company

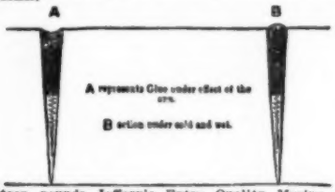
678 West Grand Boulevard
DETROIT, MICH.

Export Office: 47 Broadway, New York

APPLICATION OF MARINE GLUE TO DECKS

The reduced Section of Deck (see cut) shows the appearance of the Glue in the seams when the planks are under expansion and contraction. The flexibility of the Glue is one of its most valuable qualities, as it allows the timbers to contract and expand, still retaining its great adhesive power to the edges of the plank.

When the planks become contracted by the heat a draught takes place on the Glue, and the seam becomes expanded, as shown at A. When the planks are swollen by rains and there is a pressure on the Glue, the seam becomes contracted, as shown at B. As the temperature varies, these forms, A and B, continue to assume each other's shapes year after year (if the deck has been properly caulked and payed) until the deck becomes worn down to the Oakum. IT DOES NOT STICK TO THE FEET IN HOT WEATHER.



Fourteen pounds Jeffery's Extra Quality Marine Yacht Glue will run from 200 to 250 ft. of seam three-quarter in. deep by one-quarter in. wide. If properly used and not overheated, it will last four to six years in a seam, and has been known to last ten to twelve years. When carefully applied to a dry deck it will never leave the sides of the seam.

Send for directions for use, etc.

W. Ferdinand & Co., 201 South St., Boston, Mass., U. S. A.

Quality Cushions

MATTRESSES, PILLOWS AND UPHOLSTERY

Manufactured since 1845 by

M. W. FOGG

202 Front St., New York City

No Catalogues

Hall Opposed Marine Engine

Four-cycle, 2 and 4 Cylinder opposed from 3 to 50 H. P.

Mechanically and explosively balanced, without counterweights; smooth, steady running. No gaskets to blow out. Moving parts enclosed in crank case and cylinders; protected from dirt but easily accessible. Perfect lubrication. Mechanically operated valves. Automatic float-feed carburetter. Governor automatically controls speed of engine from full load to no load. Engine can be put under seat or in large boats, under floor. Fully guaranteed. We also build engines for all power purposes, and direct-connected electric lighting units. Write for catalogue, stating your requirements.

HALL GAS ENGINE MFG. CO. 140 Orr St. Byesville, Ohio

INSURANCE POLICY ON

SPARK PLUGS FOR LIFE

STURDY PLUGS

are protected for boat use; you are insured against troubles of every description.

One Spark Plug in leather case *free* with every mail order for a set of four or six.

$4 Gets Five $1.25 Plugs

Sturdy Mfg Co., 2637 Michigan Ave. Chicago

Best grade cedar canoe for $20

Detroit canoes can't sink

All canoes cedar and copper fastened. We make all sizes and styles, also power canoes. Write for free catalog, giving prices with retailer's profit cut out. We are the largest manufacturers of canoes in the world.

DETROIT BOAT CO., 121 Bellevue Ave., **Detroit, Mich.**

Kenebec Motor Canoes

MOST DELIGHTFUL BOATING THERE IS

All the pleasure of canoeing combined with the speed and convenience of motor boating. Thoroughly tested and reliable motor. Strong, light, speedy hull. If equipped with sponsons, absolutely non-capsizable.

Write for catalog of motor, sailing and paddling canoes.

Kenebec Motor Canoe Co., 95 Chaplin St., Waterville, Me.

HUDSON YACHT AND BOAT CO.

HYACK-ON-HUDSON N.Y.

Builders of Pleasure and Commercial

Power Boats Built to Order

"Dawson Built" high speed power boats combine every feature of modern marine construction with your individual needs. "Dawson Built" means Finest Workmanship, Perfect Design, Latest Improvements. Built under supervision of experts. All hulls tested in Model Basin, before building.

Write for sketches and specifications.

DAWSON BOAT CO. WASHINGTON, D. C.

MOTOR BOATING

THE NATIONAL MAGAZINE OF MOTOR BOATING

Trade Service Department

Free to Advertisers

Advertisers who have not the benefit of advertising agency connections are invited to make use of **Motor Boating's** Trade Service Department in the preparation of their advertisements.

The services of this department are free to advertisers, no charge being made except for engravings, which are billed at cost.

This department includes a corps of advertising writers and artists experienced in marine work and equipped to supply original designs or follow any suggestions the advertiser may give.

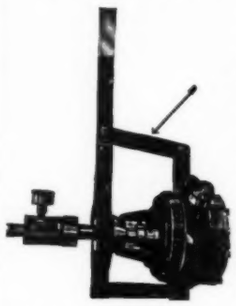
Correspondence is invited. Address

Trade Service Dept.,

MOTOR BOATING

381 Fourth Ave., New York.

The Paragon Reverse Gear



Is built for those who want reliability. Its reliability has won for it the reputation of being the best reverse gear.

"Ask The Man Who Uses One"

Manufactured by

Evans Stamping & Plating Co.

Cushman St., Taunton, Mass.

BRANCHES:

141 Liberty St. - - - - - - New York
1205 Michigan Ave. - - - - Chicago, Ill.
243 Columbus Ave. - - - - Boston, Mass.

Handled in Canada by The Canadian Fairbanks-Morse Co., Ltd.

Motoring and Sailing Knowledge

Of practical value is contained in simple language in these recent additions to the handbook series:

NAVIGATION FOR THE AMATEUR—Captain E. T. Morton. Short treatise on simpler methods of finding position at sea.

The new textbooks for outdoor work and play

THE AUTOMOBILE—Its selection, Care and Use—Robert Sloss. Plain and practical advice.

THE YACHTSMAN'S HANDBOOK—Commander C. S. Stanworth, U. S. N., and others. Sailboats and motors. Ground tackle, handling lines and sails, soundings, etiquette.

THE MOTOR BOAT, Its Selection, Care and Use—H. W. Slauson. Care of motor receives special attention. Camping and cruising suggestions.

Purchase from bookstores or direct at 70 cents a copy. Postage extra, 5 cents. Send for free Outing Handbook catalogue.

OUTING PUBLISHING COMPANY
OUTING MAGAZINE OUTING HANDBOOKS
141-143 WEST 36TH ST NEW YORK 123 S MICHIGAN AVE CHICAGO

The Thompson Automatic Feathering Propeller

FOR THE

Auxiliary

Sold by all dealers

NOYES MACHINE CO.

FRONT STREET

SO. PORTLAND, MAINE

TRADE MARK **PETRO** **IF YOU USE Liquid Calking**

your boat will never leak. Saves time-labor-money. Write for booklet today.

PETRO MANUFACTURING CO.

323 N MAIN ST. ROCKFORD, ILLINOIS

FOUR CYCLE LIGHT DUTY

REGAL ENGINES

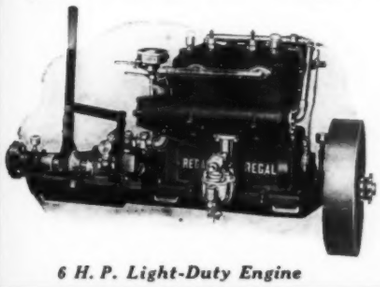
MEDIUM DUTY HEAVY DUTY

Regal Marine Engines are the kind from which you should select a type and size suitable for your boat. There are many thousands of Regal owners that will tell you so.

They will tell you what they invariably tell us: that there is no better engine made, none more quiet running or more reliable, so simple that their wives and daughters use the boat without assistance.

You must consider a four-cycle engine for the boat. Practically all automobile engines are four-cycles because the type consumes about one-half as much gasoline as the two-cycle engine and is far more reliable and longer lived.

You should require even a better engine in a boat than in an automobile, because engines are run more severely and for longer periods. A breakdown at sea is always more inconvenient than upon land. Often your very life may depend upon the faithfulness of the engine.

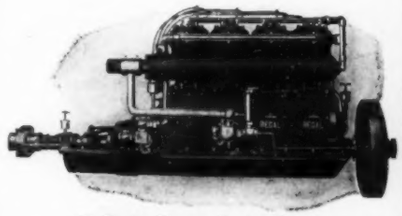


6 H. P. Light-Duty Engine

Regal Marine Engines are four-cycle. You may pay less for an engine, but it would probably be a two-cycle engine. You can pay more money for a four-cycle engine, but it is impossible to buy a better engine than the Regal. They are not made. Write for catalogue.

Regal Gasoline Engine Co.

74 W. Pearl St. Coldwater, Mich.



45 H. P. Heavy-Duty Engine

THE HIGHEST GRADE MARINE ENGINE IN THE WORLD

THIS IS NOT ONLY WHAT WE CLAIM FOR

RALACO

THE SILENT SIMPLIFIED ENGINE

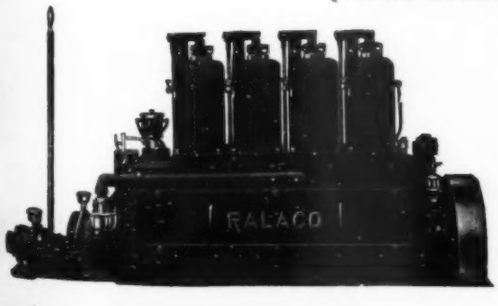
BUT IS A FACT ADMITTED BY ENGINEERS THE WORLD OVER

The most compact, clean, simple and efficient engine on the market. RALACO equipped boats defeated practically every well known make of marine engine during the past season in races for cruising power boats.

IF YOU WANT { **Reliability, Silence, Economy, Freedom from Trouble, and Satisfaction**

The RALACO will meet your requirements.

For full information write



THE S. M. JONES COMPANY

MAIN OFFICE AND FACTORY:

616 Segur Avenue - - Toledo, Ohio

New York Office, 136 Liberty Street

AGENTS:

C. W. Estabrook, - - - 33 Broad St., Boston, Mass.
Geo. O. Olson, - - - The Bourse, Philadelphia, Pa.
A. W. LePage Gasoline Eng. & Supply Co., Vancouver, B. C.

"THE YANKEE"

SILENT MUFFLER and WHISTLE OUTFITS

For AUTOMOBILES, LAUNCHES AND MOTOR BOATS

The only Muffler made without back pressure or noise at all speeds of the engine. Water-tight. No complicated parts. Made of galvanized steel and light in weight. Made in various sizes.

The "Yankee" Whistle Outfit is quickly attached to any make gasoline engine. Furnished complete, as shown. Passes Government inspection, filling every requirement of the law. Whistle can be heard for miles. All parts in sight are brass highly polished.

For sale in New York, by Durkee & Co., Chas. E. Miller, E. J. Willis Co., John C. Hopkins; Chicago, Geo. B. Carpenter, Wells and Michigan St.; Canada, Canadian Fairbanks Co., Montreal, Toronto and Vancouver. Write for descriptive catalogue on full line.

Manufactured only by

"THE YANKEE" COMPANY, Inc.

1 Genesee St., Utica, N. Y., U. S. A.

This Magnificent Steel Launch

Stylish 16-Footer Fully Equipped with Engine Ready to Run!

$96

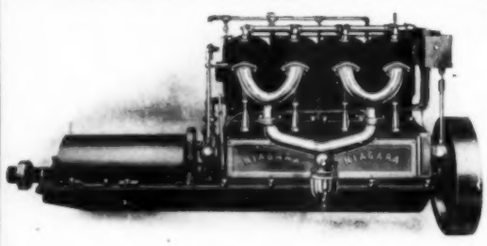
1912 models of the Michigan Steel Launch are now ready for delivery at the lowest prices quoted on boats anywhere. Our special low price schedule for immediate orders covers every launch we make—18, 18, 20, 23 and 27-footers. All sizes in stock for immediate shipment. We are the sole owners of patents covering rolled-seam constructed boats. This construction lasts practically a lifetime. We have the only construction that has successfully made the terrific trip through Grand Canyons of Colorado and Arizona. Write for booklet describing trip. Gold medals awarded our Boats and Engines by Royal Imperial Tech. Society, St. Petersburg; Internat'l Exposition, Milan; Nat'l Motor Boat Show, Paris.

Equipped Bow and Stern with Air-Tight Compartments. The Non-Sinkable Boat—Absolutely Safe! Needs No Boathouse

Leave your Michigan Launch in the water or out on the beach in all kinds of weather for months. It is puncture-proof. Equipped with the wonderful Detroit Engine, guaranteed for five years, any horse-power from 2 to 50. Fewest moving parts of any engine made. Anyone can run it. Free fully illustrated catalog shows all 1912 models. Don't buy a launch until you see this book. Write for special proposition and prices to Demonstrator Agents. STEEL ROWBOATS, $25. Need no boathouse. Big money in boat livery.

MICHIGAN STEEL BOAT COMPANY, 1236 Jefferson Avenue, Detroit, Michigan, U. S. A. [133]

NIAGARA MOTORS MEAN POWER



ECONOMY, DURABILITY

ARE FOUR CYCLE

14 Models in 2, 4 and 6 Cylinders
5 to 100 H.P.

For Cruising, Racing, Fishing, Freighting

Not low priced, but eventually cheapest.

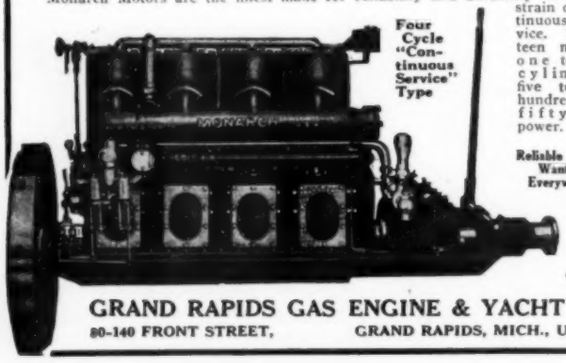
Niagara Gasoline Motor Co.

194-204 Breckenridge Street
BUFFALO, N. Y.

USE ANY FUEL IN MONARCH MARINE MOTORS

Monarch Multiple Fuel Motors run on either gasolene, petrol, naphtha, benzine, alcohol, distillate, kerosene or paraffin.

Monarch Motors are the finest made for reliability and durability under the strain of continuous service. Seventeen models; one to six cylinders; five to one hundred and fifty horse power.



Four Cycle "Continuous Service" Type

Reliable Agents Wanted Everywhere

Write today for our latest catalog

GRAND RAPIDS GAS ENGINE & YACHT CO.

80-140 FRONT STREET, GRAND RAPIDS, MICH., U. S. A.

CEDAR LUMBER

ANY QUANTITY—ANYWHERE

AT ONCE

We pay freight anywhere in the United States.

JORDAN BROS. LUMBER CO
NORFOLK, VA.

CEDAR MOORING BUOYS

WE have a proposition to offer you free if you will write us and mention this paper. It will make money for you.

AUTO SPECIALTIES MFG. CO.
656-658 THIRD ST., MILWAUKEE, WIS.

METEOR MOTOR BOAT SUPPLIES

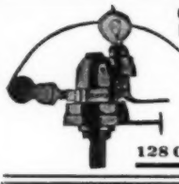
NARRAGANSETT CHEMICAL CO.
PROVIDENCE, R.I.

NEVERFURL FLAG STAFF

Keeps flag unfurled—cannot wrap around staff. Easy to remove flag or unstep staff and flag for stowing away. Held into deck by bayonet lock. Made for bow or stern. Will not rust.

Ready for use, $4.50 a pair. Write for literature

NOVELTY MFG. CO. WATERBURY, CONN.



CHANGE YOUR OIL LAMPS TO ELECTRIC $1.00

These attachments fit any oil burner. Can also be obtained for sconces. When not in use fold out of way. They snap right on. Easy, simple and reliable. Complete with bulb. Send for large illustrated catalog of other specialties

A. W. ROSEN & CO.
128 Chambers Street New York

Immediate shipments can be made of

Schug's Motor Boat Lighting Outfits

Send for Catalog now.

We also manufacture COILS and STORAGE BATTERIES of the highest quality.

Schug Electric Manfg. Co., 321 East Jefferson Ave. Detroit, Mich.

NEW DEPARTURE BALL BEARINGS

are particularly adapted for motor boat work throughout the power plant. Made in three types.

Double Row, combined radial and thrust.
Single Row, for radial loads only.
Radax, for radial and one direction thrust loads.

Write today for 1912 catalogue.

NEW DEPARTURE MFG. CO., BRISTOL, CONN.
Western Branch, 1016-17 Ford Building, Detroit.

Mea MAGNETO

Equally hot spark in advance and retard.

MARBURG BROS., Inc.
1777 Broadway, New York.

Yale Motors

BUILD THEM YOURSELF

We furnish Castings, Forgings and Drawings
Blow Your Whistle with a Yale Air Compressor

Write for information

SUPERIOR MACHINE & ENGINEERING CO.
51-53 FORT ST. E., DETROIT, MICH.

Red Head SPARK PLUG

Buy Motor Oil for its Lubricating Properties, *Not* for its Color Alone

In the production of high-grade lubricating oils and greases, it is essential that certain well-defined conditions be observed through the entire process of manufacture. The appearance of an oil as to color does not determine the lubricating value or its suitability for your motor—the important feature, however, is the filtration to the extent of removing all impurities and to preserve the *Power-Producing Properties of the lubricant.*

Owing to the complex conditions under which motors are operated, such as extreme piston speeds, excessive heat, sudden changes of temperature, and exceptional vibration, it is necessary to use a lubricant that is manufactured especially to meet these requirements.

Where inferior oil is used it is necessary to frequently "flood" the motor. This "heroic" treatment, while affording temporary relief, results in the fouling of valves and sooty spark plugs—likewise ignition trouble and loss of power. *Lubroleine Motor Oils* produce a continuous oil film of remarkable staying qualities which reduces friction to the lowest point. This film keeps moving parts from contact under any working temperature, no matter how small the clearance or how heavy the pressure. Furthermore, the economy of using these oils is not in the *Price per Gallon*—but in the increased *Mileage* and reduced *Maintenance Cost*

WHERE OTHERS FAIL

LUBROLEINE

OILS and GREASES

"MAKE MOTORS MAKE GOOD"

The quality and character of the crude oil we use (the best Pennsylvania crude oil) and the whole process by which it is refined and manufactured all go to make *Lubroleine Motor Oils* the standard by which others are often compared and usually judged.

What has been stated regarding the oils for automobile, marine and aeroplane motors is equally true concerning Lubroleine Cup Grease, formerly known as Climax-Synovia and Lubroleine Gear Case Lubricant formerly known as Phoenixo, which, used in conjunction with *Lubroleine Motor Oil,* positively assures the maximum of power and efficiency at lowest ultimate cost.

If it should happen that your dealer does not carry a full stock of *Lubroleine Motor Oils and Greases,* do not accept "just-as-good" substitutes, but let us hear from you at once, giving make and type of your car, and we will see that you are promptly supplied. Write for booklet "The Mission of Lubroleine"—contains valuable information to motorist.

DEALERS: Our Dealer's Proposition is Worth Looking Into—Write

Fiske Brothers Refining Co.

Established 1870

Pittsburgh New York Newark

DISTRIBUTORS

FOR PACIFIC COAST
WATERHOUSE & LESTER CO.
San Francisco Oakland Los Angeles Sacramento San Jose

FOR PROVINCE OF QUEBEC
P. T. LEGARÉ, Ltd., Quebec
LEGARÉ GADBOIS AUTOMOBILE, Ltd., Montreal

Robert W. Chambers'

New Novel Illustrated By

Charles Dana Gibson

"The Streets of Ascalon"

is Mr. Chambers' strongest, most ambitious novel. "The Common Law" was good, and so was "The Fighting Chance"; but "The Streets of Ascalon" towers head and shoulders over either. It is unconventional perhaps—and daring—but tense, dramatic, and fascinating, all the way through. It is beyond question the greatest novel Mr. Chambers has written.

Charles Dana Gibson has illustrated "The Streets of Ascalon," and his is the final touch in making this the big novel of the year. Above is a picture of the heroine as she has been drawn by Mr. Gibson. His drawings for this novel are among the best he has ever done—and Gibson's best is the best.

Remember: "The Streets of Ascalon"—Gibson and Chambers—in the MAY

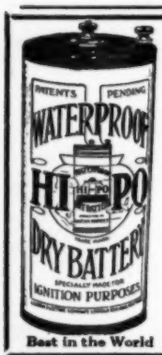
Cosmopolitan

Cosmopolitan Magazine, 381 Fourth Avenue, New York City
Gentlemen: Having read your advertisement, I enclose 25 cents. At Your Risk, for the next three issues of Cosmopolitan.
Name.....
Street.....
City.....
State.....
M B 5

For 25 Cents

You can secure the next three issues of Cosmopolitan. Simply sign the coupon below and mail it to us with a quarter, AT OUR RISK. You will at once be entered to receive the next three issues of Cosmopolitan at a saving of just 33⅓% over our regular subscription price. Make sure of the Chambers-Gibson novel by signing the coupon now.

Cosmopolitan Magazine
381 Fourth Avenue New York City



Best in the World

HI-PO WATERPROOF

DRY CELLS No. 6, size 2½" x 6"

25c. each

The only cell protected by an insulated **waterproof case.**
Absolutely guaranteed for all marine work.

They cost no more than the others and do away with all your battery troubles.

If your dealer does not keep them, we supply direct upon receipt of remittance.
Freight charges prepaid on orders for 12 cells and more.

LINCOLN ELECTRIC COMPANY, 1007 Atlantic Ave., Brooklyn, N. Y

BURNS WITHOUT ODOR

Barthel Juwel Yacht Stove

Generates gas from Kerosene, giving hot blue flame. Absolutely safe, even if overturned while lit.

Has Galvanized Frame with Brass Rail around Top and Pan Beneath for Yacht and Boat use. Several styles.

Write for catalogue and prices.

Globe Gas Light Company
25-27 Union St., BOSTON, MASS.

THE RICHARDSON ENGINEERING MANUFACTURING CO. COMPLETE OUTFITS
ELECTRIC LIGHTS
6 FORD STREET HARTFORD, CONN. U.S.A.
LAUNCHES AND YACHTS RESIDENCES & COTTAGES
SEARCH LIGHTS

RICHARDSON ENGINEERING & MFG. CO.
Hartford Conn.

WONDER

Wonder Engines

Most Power for Least Money

Built for speed, pleasure and work—all sizes—every engine guaranteed five years. Write today for large illustrated catalog.

WONDER MFG. CO., 260 Tallman St., Syracuse, N. Y.

Engines for All Purposes

Vertical and opposed four cycle, from 6 to 50 h. p.

CATALOG FOR THE ASKING

MILLER BROS.
2331 N. Talman Ave., Chicago, Ill.

2-Cycle--All Open Base

A dozen superior features. Before placing your order for a gasoline motor, it will pay you to look over our catalogue.

VANGUARD ENGINE COMPANY
18 Tremont Street, Boston, Mass., U. S. A.

VAN BLERCK MOTORS
SPEED AND MEDIUM DUTY

High speed types, 4 and 6 cylinders, 40 to 80 H. P. Medium duty types, 2, 4 and 6 cylinders, 12 to 50 H. P. Catalog on request

VAN BLERCK MOTOR CO.
40 Hubbard Ave. Detroit, Mich.

STANLEY MARINE MOTOR
High in Quality Low in Price

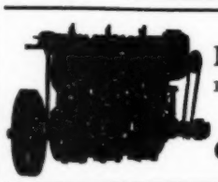
THE STANLEY CO.
SALEM, MASS.
Send for Catalog

PRODUCER —GAS— Will Save you money for **POWER** 5 to 5000 H.P. Plants

Absolutely reliable and we guarantee commercial results. Let us talk it over with you or send for catalogue.

MARINE PRODUCER GAS POWER CO.
2 Rector Street New York City

LISKS MARINE ENGINES
4 CYCLE ONLY
1 to 6 Cylinders. 5 to 40 H.P.
Manufactured by
GEO. A. LISK
1190 West Jefferson Avenue Detroit, Mich



Goshen Marine Engines
1, 2 and 3 Cylinders, 3 to 50 H.P
Two port system with springless check valves
ASK US
Goshen Motor Works
Goshen, Ind.

THE THELMA ENGINE

Tremendous power, compact, exclusive, no complications, simple and absolutely dependable.

Recognized by Detroit River motor-boat men as the most efficient motor-boat engine made. Write for descriptive circular.

THE THELMA MOTOR WORKS
270 Junction Avenue DETROIT, MICH.

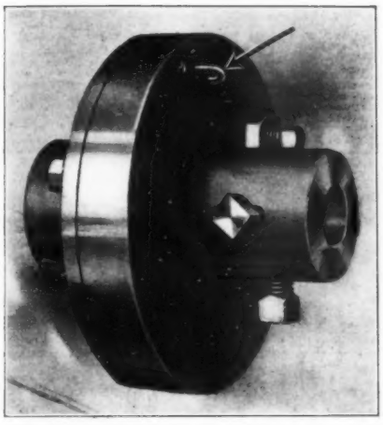
"CANADIANS"
'W. & K.' MOTORS
2½ H. P. complete $65.00
5 H. P. 2 cyl. complete $120.00
Made in Canada. No Duty
"W. & K." MOTOR CO.
10 Wyandotte St., WALKERVILLE, ONT.

Belle Isle Motors

"You see them wherever you go. They go wherever you see them"
Free Catalog
CONCRETE FORM & ENGINE CO.
12 Congress W. Detroit, Mich.

Floating Obstructions

Can't Break Your Propeller If Equipped With The Roper Safety Coupling!



TAKES the place of the coupling now connecting your engine with propeller shaft.

Drives **positively** until propeller hits something---**then the pin cuts off and your propeller is saved from injury which it would suffer if the power should continue to act upon it.**

It's the difference between losing a whole propeller and losing only a brass pin.

Costs Only $5 to $8

according to size. Full instructions given how to adjust it to *your* engine. Write today for more facts.

Ask for Catalog No. 10

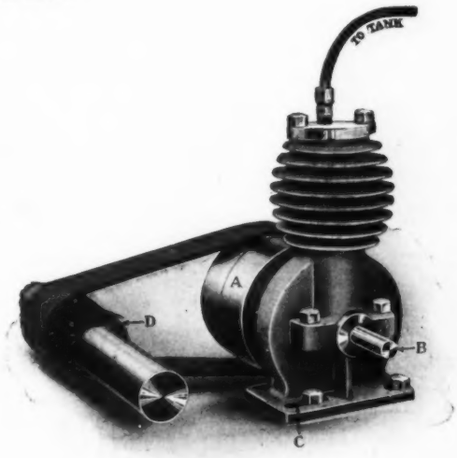
C. F. ROPER & CO.
HOPEDALE, MASS.

DON'T
Crank Your Head Off
SNAP
Your Motor Over with a
LOMBARD
Safety Gas Engine Starter and Wear a
SMILE

Model D

The above cut represents a modification of our Model D to be installed on the Bulk-head. Especially good for the popular Runabout or Autoboat. Write for circular and price.

Another Lombard and a good one. A well designed, compact, and neat whistle pump that any one can install for the low price of $7.50.



A—Tight and loose pulley. B—Shaft for bilge pump.
C—Belt adjustment. D—Tire tape on engine shaft.

Lombard Mfg. Co.
Rochester, N. Y.

THERMOS

DOES AWAY WITH FIRE and ICE on BOATS

Fire is dangerous, ice is bulky. Thermos gives you heat without fire and cold without ice.

An afternoon's outing or a month's cruise is infinitely pleasanter with Thermos aboard to keep your tea, coffee, cocoa or soup, hot or your drinking water or other beverages cold.

Thermos keeps liquids ice cold for 3 days or piping hot for 24 hours.

Thermos Lunch Kits contain one or more Thermos Bottles and knives, forks and spoons, and have compact rust-proof food compartments.

Thermos Bottles $1 up. Thermos Lunch Kits $2.50 up On sale at Drug, Department, Hardware, Jewelry, Stationery and Sporting Goods Stores and Automobile Garages. All dealers—and all at one price. There is but one make of Thermos articles. If your dealer will not sell you *genuine* Thermos, we will ship you prepaid, upon receipt of price. Write for catalog.

AMERICAN THERMOS BOTTLE CO.,
Thermos Building, New York.
Thermos Bottle Co., Ltd., Toronto, Can.

The Aquaplane

A new water sport. So fascinating are the sensations enjoyed from riding an aquaplane that one may be found in connection with nearly every motor boat, yacht or launch capable of 8 miles an hour or better. Get the latest fad for $3.50 and learn what fun is. Send for our circular telling how to enjoy the aquaplane.
AQUAPLANE CO., Roanoke Bldg., Chicago.

Greatest Launch Values Ever Offered

This Handsome, Graceful, Seaworthy, Speedy Runabout complete, only $94.50

Other similar values in 16-ft., 18-ft., 20-ft., 23-ft., 27-ft. and 30-footers at the same proportionate prices. We are the world's largest power boat manufacturers. Selling direct at Factory Prices, we save you half.

Send for Our 1912 Boat Catalog Today—Mailed Absolutely FREE! It illustrates with full descriptions the famous Detroit Family Launches, Runabouts, Speed Boats, Auto Boats, Speed and Power Canoes, Pullman Cabin Cruisers, fully equipped with berths, galley, etc., for extended cruises. Sixty-four models in all sizes, ready for immediate shipment. All Detroit Boats are equipped with the most efficient, smoothest running, non-complicated marine engine ever built. Starts without cranking—reverses while in motion—has only three moving parts. Guaranteed for 5 Years. So simplified any child can operate it. Detroit special construction combines more speed with greater seaworthiness than any other boats made. Ask any of our 12,500 satisfied owners. We have a new confidential proposition to make a limited number of motor boat enthusiasts to act as our demonstrating representatives. WRITE QUICK. Detroit Boat Co., 1147 Jefferson Ave., Detroit, Mich.

NO LOSS OF HEAD ROOM

SPECIALISTS ON CABIN FIXTURES

Send for our complete Catalogue.

Stop Paying for Marine Engine Experiments

Reputable agents wanted to handle popular-priced marine engine. **Absolutely guaranteed for 5 years. Thirty days' trial by the purchaser. Your money promptly refunded, without question, if you are not fully satisfied.**

A sure favorite and quick seller. Big returns assured. Simplicity the keynote of construction.

Just the engine you have been looking and waiting for. Combines the good features of the best, with all the bad ones eliminated.

Fool-proof. As near perfect as anything mechanical can be produced.

All sizes in stock from 2 to 50 h. p. Ready to ship on 24 hours' notice if necessary.

Details of the greatest selling plan and agents' money-making proposition ever offered.

Liberal discount, specified territory and absolute protection to accepted agents.

Some very productive territory still open.

Write today for Catalog (134)

COLUMBIA ENGINE COMPANY
3 Mt. Elliott Avenue, DETROIT, MICH.

The Peerless Separator

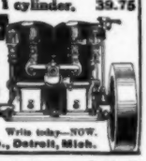
Prevents carbon formation in cylinders—adds to your mileage—and to life of motor. Wears life time. Write today for catalog.

STOTT-CROWLEY CO.
1041 Grand River Avenue Detroit, Mich.

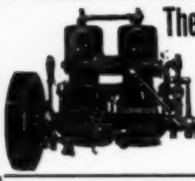
SANDOW MARINE ENGINE

8 h. p., 2 cylinder, $125.00
4 h. p., 1 cylinder, 57.00
2 h. p., 1 cylinder, 39.75

BUILT LIKE AN AUTOMOBILE ENGINE.
2 to 20 h. p., ready to ship; gasoline or kerosene. Drives boats of all kinds; starts easy; cannot backfire; almost noiseless. 5-Year ABSOLUTE GUARANTEE—30-Day Trial. Three moving parts—women and children run it. Starts without cranking. Demonstrate an engine for us and get yours at cost. BE FIRST IN TERRITORY TO GET OFFER. Sales plan and literature FREE, postpaid. Write today—NOW.
Detroit Motor Car Supply Co. 5 Helen Ave., Detroit, Mich.



The Frazer-Adams 4 H. P.



The most popular small double cylinder engine on the market. Other sizes 2 to 12 H. P., 1 to 3 cylinders. Write for catalogue and special price on first engine.

FRAZER BROS. CO.
103 River St., Adams, N. Y.

BIDDLE MONEL METAL PROPELLERS

Non-Corrodible Stronger than Bronze Shine like Silver

Biddle Propellers are designed by experienced naval architects. Blades are planed absolutely true to pitch. Write for booklet on propellers and hardware.

Biddle Hardware Co., 6th and Commerce Sts., Philadelphia
Est. 1837. Branch offices: London, Stockholm, Montreal, New York

MONOPLEX

MARINE HORN

ATWATER-KENT MFG. WORKS
48 NORTH 6th STREET PHILADELPHIA, PA.

APPLICATION FILED SEPT. 3, 1910.

IMPROVEMENT on Patent No. 933,151. Propellers for the marine service. Manganese-bronze (Ajax metal) propellers, two-blade and 12-inch diameter (14-inch dia. the flat measure), for sale. Price of each, $4.00. Write or mail orders to

THEODORE AMNELIUS
So. Framingham, Mass.

THE BANTAM ANTI-FRICTION CO

WE MAKE THE BEST

BANTAM, CONN. U. S. A.

GET OUR NEW CATALOGUE

MARINE MODELS

PATTERN MAKING, INVENTIONS DEVELOPED, SPECIAL MACHINERY
The H. E. BOUCHER Mfg. Co.
20 FULTON STREET, N. Y., U. S. A.

Bottger Bros.

Mak^ers of
YACHT SAILS
SPRAY HOODS, ETC.
CITY ISLAND
NEW YORK
Catalogue by Request

Why? Why? Why?

Why be out of date? Why use out of date paint? Why scrub off the bottom of your boat? Why not take advantage of new ideas? Why not be up to date? Why not buy Bridgeport Bronze Paint and never have to haul or scrub off your boat "in the good old summer time?"

Bridgeport Bronze Marine Paint Co.
Cable Address, "Laquero Bridgeport." *Bridgeport, Conn.*

CHASE Leather

Looks and wears like genuine leather at one-third the cost. Unequalled for motor boat upholstery, Mackintosh and rubber cloths for spray hoods, covers, etc.

Samples on request.

L. C. CHASE & CO., Boston, Mass.
New York Chicago San Francisco

CHELSEA CLOCKS

Clocks for use on yachts, steamships, etc., with (patent applied for) electric attachment for operating ship's bell. Made by the largest makers in America of exclusively 8-day high grade marine, ship's bell, mantel and auto clocks. Write for price list today.

CHELSEA CLOCK CO.,
16 State Street, Boston, Mass.

REAL BOATS

Write for Booklet C 7

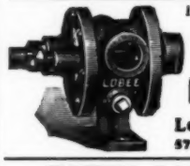
MILTON BOAT WORKS
RYE, N. Y.

ZARAK

The only efficient, low-priced electric Motor Boat Horn on the market.

$9.50 Complete

ZARAK MFG. CO., 52 CEAPE STREET OSHKOSH, WIS.



If you want Good Circulation on your

Automobile, Launch or Motor Boat use a

LOBEE PUMP

Lobee Pump & Machinery Co.
57 Bridge Street -:- Buffalo, N. Y.

KOVEN GASOLINE TANKS

For Gasoline, Air for Whistles, Oil, Water, Mufflers, Condensers, etc. Heavy sheet iron and plate steel work of any shape desired. Galvanizing of all kinds of boat work.

L. O. KOVEN & BRO.
CLIFF STREET NEW YORK CITY

POLARIS

TRADE MARK
SE NW
Standard Quality

COMPASSES AND BINNACLES

ASK FOR DESCRIPTION OF ILLUMINATED COMPASS
MARINE COMPASS CO. BRYANTVILLE, MASS. - NO REFLECTIONS -
LIGHTS ONLY THE POINTS ACTUALLY NEEDED.

TROUT WHEEL

Two, Three or Four Blade For Speed Boats or General Service.

TRADE MARK TROUT

Adopted by the Foremost Engine Makers of the Country.

H. G. TROUT COMPANY, BUFFALO, N. Y.

WHITE BOAT CEDAR

ALSO MAHOGANY AND WHITE OAK

All thicknesses and lengths in stock for immediate shipment

WM. P. YOUNGS & BROS.
First Avenue and 35th Street NEW YORK CITY

Hopkins

EVERYTHING FOR MOTOR BOATS
SOLD TO YOU AT MANUFACTURER'S PRICES.

Hopkins
LIFE PRESERVER CUSHION

For Yachting, Motor Boating or Canoeing, Hopkins Life-Preserver Cushion is an absolute necessity. It is comfortable and ornamental, covered with durable, artificial Spanish leather, filled with non-absorbent Javanese Fibre, impervious to water, with four times the buoyancy of cork.
Delivered anywhere in U. S. $1.25.
Send for samples of styles and coloring.
SPECIAL.—These cushions also made up with your club flag or burgee embroidered thereon. Write for prices.

SAILING LIGHTS
FRESNEL GLASS
REQUIRED BY LAW

For Class No. 1 Boats		For Class No. 2 Boats	
2 Lights Galvanized	$2.75	4 Lights Galvanized	$4.40
2 Lights Pol. Brass	$3.62	4 Lights Pol. Brass	$6.57

COMPLETE OUTFIT for Class 2 Boats Galvanized $9.78, Pol. Brass $11.90
Write for SPECIAL CIRCULAR, or Class 1 and Class 2 Boat Requirements

MADE TO ORDER SPECIALTIES
Cushions, Sails, Boat Covers, Spray Hoods, Flags, Awnings, Etc., made to order at lowest possible prices for satisfactory work. Send measurements and get estimate.

Hopkins FREE COMPLETE CATALOG
Saves you dollars on all motor boat equipment. Write for it today.
Hopkins 119 Chambers Street, New York

Your Working Boat Needs a
Hettinger Engine
The Engine That Runs in Schools

OF the annual output of **HETTINGER ENGINES,** a larger percentage has gone into working boats every year for ten years past than is true of any other marine engines.

Why?

For the same reason that owners of working boats are changing every year from other makes of engines to **HETTINGER ENGINES—**

for the same reason that there is no case on record where a man who has owned a **HETTINGER ENGINE** has bought any other make of engine thereafter—

because the **HETTINGER ENGINE** is above all a **practical** engine—because it delivers more power at a given fuel cost, or the same power at less fuel cost, than other types of engines. Because the **HETTINGER ENGINE** is simplicity itself—no small working parts to get out of order—no exposed moving parts to catch the clothing.

With the **HETTINGER ENGINE** repairs become a factor so surprisingly small that every Hettinger owner is an enthusiastic booster. That's why **HETTINGER ENGINES** run in schools. That's why one **HETTINGER ENGINE** on a fishing boat or passenger boat in any community is always the forerunner of a school of **HETTINGER ENGINES** within the next couple of seasons—for even the pleasure boat owner wants the engine that has proved its superiority under such rigorous every-day tests.

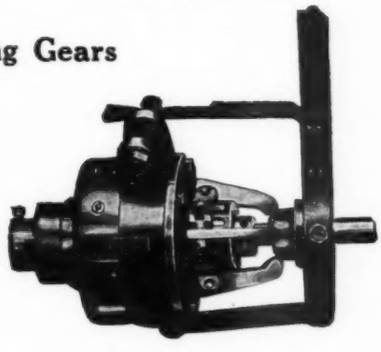
If you want an engine that "makes good, because it is made good," send to-day for our booklet B.

Hettinger Engine Co., Bridgeton, N. J.

One of the most complete, up-to-date factories in the country for the exclusive manufacture of gasoline engines

Joe's High Power Gears
1912 MODEL
Catalog Ready

Racing Gears



Safety Rear Starters

THE SNOW & PETRELLI MFG. CO.
152-156 Brewery St., New Haven, Conn.

AGENTS: J. KING & CO., Limehouse, London, England; L. H. COOLIDGE CO., Seattle, Wash.; THE CANADIAN MOTOR & SUPPLIES CO., Montreal, Canada; O. SCHWENKE, Charlottenburg, Germany; GASOLINE ENGINE EQUIPMENT, 133 Liberty Street, New York.

This label means everything to you

PRIME JAVA KAPOC
WILL SUSTAIN
AFLOAT 25 TIMES
ITS NET WEIGHT FOR
48 HOURS
G.W. SAMMET & SON Co.
BOSTON, MASS.

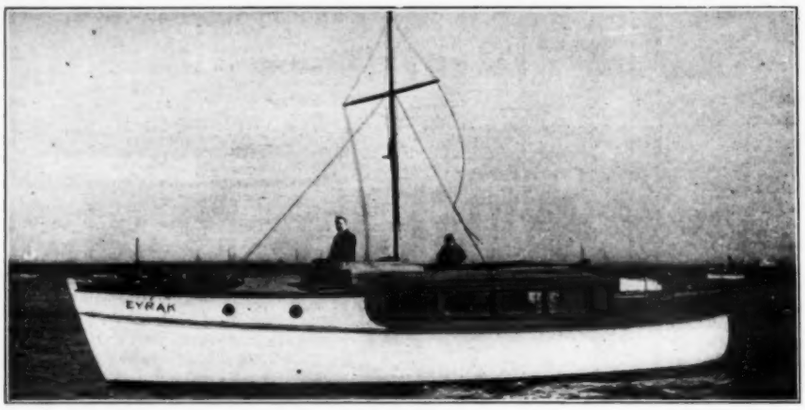
In explanation, it means that the U. S. Dept. of Commerce and Labor demands it for your protection. It is on every Sammet Motor Boat cushion, stamped as per instructions from the government.

The requirements of a motor boat cushion are—that it must be soft, comfortable, indestructible, withstanding the most strenuous usage and immune from the action of water. If, in addition, it is a guaranteed life preserver, it is all the more appreciated.

SAMMET KAPOC CUSHIONS meet every one of the above requirements. Absolutely dependable according to guarantee stamped on the label.

All kinds and grades of motor boat cushions and upholstery of Prime Java Kapoc. Write for full information.

G. W. SAMMET & SON CO.
BOSTON, MASS.

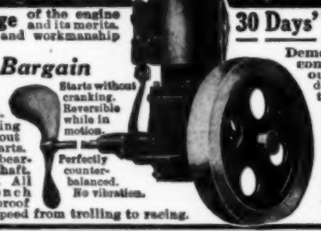


We Will Give You the Most Boat for the Money

They are neat, attractive, and reject every characteristic of commonplace construction.
Our standard types are four cruisers, a runabout and speed boats.
We also build flat bottom dinghies, in 8, 10 and 12 ft. sizes.
If you are interested in a new boat, or any specialties, write us.

THE BAYONNE LAUNCH CO., East 36th Street and New York Bay
BAYONNE *Take C. R. R. of N. J. to 33rd St. Sta.* NEW JERSEY

5 Years' Absolute Guaranty
On this Wonderful Detroit Marine Engine



You Are the Only Judge of the engine and its merits. 25,000 satisfied users. Material and workmanship guaranteed for five years.

Greatest Engine Bargain Ever Offered!

Fewest moving parts of any practical engine on the market. Nothing complicated or liable to get out of order. Only three moving parts. Extra long plastic white bronze bearings. Vanadium steel crankshaft. Adjustable steel connecting rod. All bearing surfaces ground. French gray iron castings. Water-proof ignition system. Runs at any speed from trolling to racing. Starts without cranking. Reversible while in motion. Perfectly counter-balanced. No vibration.

30 Days' Trial Try the engine for 30 days. If you are not fully satisfied, return it and we will promptly refund all money paid us.

Demonstrator Agents wanted in every boating community. Special wholesale price on first outfit sold. Single cylinder, 2-3 h. p. Double cylinder, 6-20 h. p. 4-cylinder, 20-50 h. p. Thoroughly tested before shipment. Comes to you complete with boat fittings and ready to run. Write for free catalog, testimonials and details of the greatest protective guaranty ever offered. Suitable for any boat from canoe to cruiser. Also railroad track car. All sizes in stock ready to ship. Write today for our wonderful demonstrator offer. [74]

DETROIT ENGINE WORKS
1230 Jefferson Avenue, DETROIT, MICH.

REMOVED TO NEW QUARTERS
Launches, Engines and Accessories.

WE carry a full line of marine hardware. Write for our interesting, handsomely illustrated 150-page catalogue. New discount sheet with revised prices mailed any party on request, holding our last year's catalogue.

MOTOR BOAT & SUPPLY CO.
1411-15 W. Ninth Street, Cor. Frankfort CLEVELAND, OHIO

DOES YOUR TILLER CABLE BIND?

Attach your cable to each end of an ordinary brass Rack; and one of our stock gears on your steering wheel or crank—it's a straight pull on your rudder, and well repays the investment.
We also make and have in stock Gears, Sprockets and Ratchets for your rear starter, or any other purpose.
GEAR WHEELS and GEAR CUTTING of every description
Complete Catalog sent postpaid, what's YOUR address?
Geo. B. Grant, M. E.
PHILADELPHIA GEAR WORKS 1120 VINE ST., PHILADELPHIA, PA.

BANNER MARINE ENGINE SALES CO.

1 1-2 H.P. **$23.95** Complete

BANNER MARINE ENGINES are made in 1, 2 and 3 Cylinders, from 1 1-2 to 25 H. P. These motors are guaranteed for 5 years and are shipped on 30 day trial. Send for catalog today. Agents wanted.
BANNER ENGINE SALES CO., 32-34 Congress Street, W., Detroit, Michigan

7 H. P. **$62.50** Complete

Thoroughly Waterproof and Non-Fouling

Coleman's Liquid Copper

Best and Most Durable

The only Bottom Paint IN THE WORLD that exposes a contact surface of substantially metallic copper that may be polished when desired to obtain a speed bottom of smooth, seamless copper.

COLEMAN LIQUID COPPER COMPANY
15 William Street
New York, N. Y., U. S. A.

"V" BOTTOM EXPRESS
22' 6" x 5' 1½", 20 h. p. Roberts motor, Kenyon auto top, reverse gear, rear starter, etc., $900. 18 m. p. h. guaranteed. 5 other models $225 up.
THE M. I. DOYLE CO., 50 Church St., N. Y. C.

Engines for Speed

Only the "power for weight" offered by Elbridge "Featherweight" Engines will enable you to get best results from your light tender, V-bottom, or speed hull. Our catalog will interest you. It's free.

ELBRIDGE ENGINE CO.
20 CULVER ROAD ROCHESTER, N. Y.

You Can Make This Boat at 1/3 Regular Price

You need not spend a lot of money to know all the zest of motor boating, sailing or canoeing. Put in your spare evenings now. Make the boat yourself at ⅓ of what you could buy it for. You don't have to be a mechanic. We send you knock-down frame, every piece and part of the boat cut to fit, with simple directions telling just how to do everything. It's real healthy recreation for men or boys—and you'll have a trim, sturdy, dependable craft—just the boat you've been wanting so long. Satisfaction guaranteed or money back when you build by—

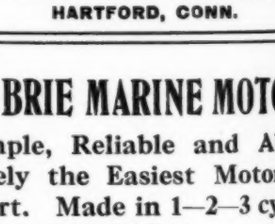
The Brooks System

You'll find exactly the model you like in the Brooks Boat Book. See letters and photographs from some of the thousands who have built by the Brooks System. You ought to have this book whether you decide to build or not.
Write today—the book is free. Address
Brooks Mfg. Co.
7405 Rast Ave., Saginaw, Michigan.

You can build any style boat you want from our full sized patterns costing from $2.50 to $12.00 according to the design selected.

The Brown-Collins Engine

1 1-2—20 H. P.
1 to 4 cylinders



The Brown-Collins Gas Engine Co.
HARTFORD, CONN.

Du BRIE MARINE MOTORS

Simple, Reliable and Absolutely the Easiest Motor to Start. Made in 1—2—3 cylinders. 2 to 30 H. P.

Write for Catalogue

Du BRIE MOTOR CO.
137 Beaubien Street, Detroit, Mich.

New York Distributors

Ferro, Van Blerck, Ideal, Erd, Uncle Sam

Call or write

GASOLINE ENGINE EQUIPMENT COMPANY
133 LIBERTY STREET NEW YORK CITY

THE GUARANTEE

of reliability in electrical apparatus is this

TRADE GE MARK

of the largest electrical manufacturer in the world
GENERAL ELECTRIC COMPANY
Principal Office: Schenectady, N.Y. Sales Offices in 45 Cities 3439

MOTOR YACHT PUMP WATER CLOSET

$20.00

For above or below water-line use. The pump cylinder is made of special composition casting. We do not use tubing threaded to flanges or rubber hose connections. The only low-price practical plumbing fixture on the market. Details and catalog upon request.
GOBLET-DOLAN MFG. CO.,
30 Old Slip, New York City.

KENYON BOAT TOPS

TOP 'EM ALL

Kenyon folding boat tops are so good—that the most big boat builders use them.

Sure—some boat builders sell other makes of tops—but they are not the big—successful ones.

They are the small fry—being caught by the "cheaper price bait." That's just the reason they are so small—they seek lower price not quality—

That policy doesn't make a business. It breaks it.

Be benefited by our years of experience in motor boat top building.

Let the big fellows decide for you—they investigate fully before they catalogue Kenyon Goods—

You can't go far wrong if your decision is influenced by their wisdom.

Kenyon TRADE MARK MOTOR BOAT TOPS

Write to-day for the new Kenyon Boat Top Catalogue.

Post a Post Card and get Posted—

THE R. L. KENYON COMPANY

163 MEADOW ST. : WAUKESHA, WIS.

Sturtevant

Aeronautical Motors

For Hydroplanes and Racing Boats

4 Cylinders—40 Horsepower—200 Pounds
6 Cylinders—60 Horsepower—285 Pounds
4-Cycle—Water Cooled.

We have received so many inquiries relating to our Aeronautical Motor for high speed motor boats, that we are calling the attention of owners of racing boats to our motors for this purpose.

They are the highest grade motors built. We put the best materials and the finest workmanship into them, and our price is sufficient to permit us to do this.

Because of their light weight, reliable service and strong, durable construction, they are especially adapted for racing boats.

Send for Catalog 200 D

B. F. STURTEVANT CO., Hyde Park, Boston, Mass.

Offices in all large cities

It has been repeatedly demonstrated that a varnish that dries quickly and does not turn white under water, cannot possess the required durability when exposed to the elements.

Do you want to use a varnish that is good only under water,—as a ***bottom paint?***

or

Do you want a marine varnish that is manufactured for ***durability,*** a varnish that is impervious to ***atmospheric changes,*** a varnish that is elastic enough to withstand the ***expansion*** and ***contraction*** of the woodwork under the action of ***rain*** and ***sun,*** a varnish that will not ***blister*** with ***heat*** nor ***crack*** with the ***cold,*** a varnish that will ***stand wear*** without showing every heel-print and bruise?

Monarch Spar Varnish

The Varnish Made For Durability

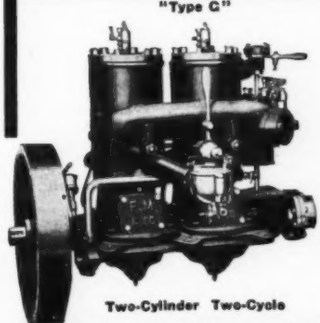
CHAS. H. GILLESPIE & SONS

Established 1824

Jersey City New Jersey

FAIRBANKS-MORSE MARINE ENGINES

"Type C"



Two-Cylinder Two-Cycle

ARE ABSOLUTELY GUARANTEED

Built for the man who wants an engine at a reasonable price, but the best engine that can be secured regardless of price.

THERE ARE MORE THAN 125,000 FAIRBANKS-MORSE ENGINES

in use to-day—many of them over 20 years in service. Surely this is a sufficient testimonial to Fairbanks-Morse quality.

Two-cycle engines, 3½ to 24 H.P.
Four-cycle engines, 4½ to 40 H.P.

Write for our catalog No. 1315NV and list of branch houses where our engines are carried in stock.

FAIRBANKS, MORSE & CO.

900 SO. WABASH AVENUE, CHICAGO, ILL.

The Canadian Fairbanks-Morse Co., Limited.
Sole agents for Canada.

Winston Churchill's great novel, illustrated by James Montgomery Flagg

is a fitting successor to Mr. Churchill's earlier successes, "Richard Carvel," "The Crisis," and "Coniston." It has been six years in preparation, and it is Mr. Churchill's strongest, most ambitious work. Unless all signs fail, its sale will exceed even the records set by Mr. Churchill's earlier novels.

"The Inside of the Cup"

is a wonderfully interesting story—one that carries you, whole-souled and intent, from the first chapter to the last—and more than that, "The Inside of the Cup" lays bare the core of a great social evil of modern days.

It unfolds the picture of our rich and our poor, our good and our wicked, our churches and our vice-hells as you have never seen it before. And the picture is true—brutally true if you like. Some of us, shorn of our self-righteousness and hypocrisy, are under a terrible indictment.

The first chapters of "The Inside of the Cup" are now appearing in Hearst's Magazine. Make it a point to read them. Note the special offer below.

Hearst's Magazine

The World To-Day

is for the progressive, up-to-date American men and women who want to keep in touch with the big things that the world is carrying on, but who want to read a popular magazine and not a pedantic text-book.

Hearst's Magazine will keep its readers in close touch with the notable things that are going on in the world—and the big men who make these things possible. It is intensely interesting this story of the World's progress, and in Hearst's Magazine you will find the story told, and illustrated, a little more clearly, a little more completely, a little better than in any other publication.

Hearst's Magazine will be conducted as a magazine of advanced and authoritative opinion, a forum for open and unprejudiced discussion of the dominant questions of the day; political, social, economic, financial, moral and ethical.

It is the purpose of the management to put this liberal education within the reach of the greatest possible number of thinking people. The price of Hearst's Magazine is 15 cents a copy, $1.50 a yearly subscription.

Simply Send a Quarter

and you will be entered for three issues of Hearst's Magazine beginning with the April issue which contains the first chapters of Winston Churchill's great novel. This is a saving of 33⅓% on our regular subscription price and is made only to introduce the magazine to you. Make sure of both Winston Churchill's novel and this saving by signing the coupon below and mailing it TO-DAY with a quarter—At Our Risk—to

Hearst's Magazine

381 Fourth Avenue New York City

Hearst's Magazine, 381 Fourth Avenue, New York City

Gentlemen: I want to read Winston Churchill's novel and enclose 25 cents—At Your Risk—for 3 issues, beginning with the April issue. Also give months' subscription to Hearst's Magazine.

Name .....

Street .....

City .....

State .....

M B 5

Be Up-to-Date!

YOU wouldn't install an ancient power plant in your boat; then why spoil its appearance with antiquated painted name or the makeshift single initials, when you can get

HICKOK Name Plates

Write for booklet G, giving size and name of boat.

THE HICKOK MFG. CO., 40 St. Paul St., Rochester, N.Y.

Monitor K-D Boat Frames.

500 Sizes for Open Boats and Cruisers. *FREE CATALOG*

MONITOR BOAT & ENG. CO., 215 Emmett St., Newark, N. J.

Sell It In The "Market Place"

When a man is looking for a certain article he naturally refers to the place where he will be most likely to find what he wants. Thousands of readers know of the bargains that are always listed in Motor Boating's "Market Place," so they look here first.

Successful advertisers follow the same course as those who are looking for something—they place their advertisements where they are most likely to be seen by prospective buyers.

Motor Boating has a guaranteed circulation in excess of 25,000 copies per issue, and every copy is seen by several persons. In this way practically every motor boat enthusiast in the country is reached, as well as the principal foreign markets. In this great audience there are sure to be several prospective customers for every article you want to sell.

We will write the advertisement if you will send full information and tell the amount of space you wish used. Enclose remittance to cover size of advertisement you want, figuring at rate of 3 cents per word, each insertion.

Mail YOUR Advertisement today

MORRIS CANVAS MOTOR HULLS

The most serviceable light hull in use. 14 miles per hour, for $250.00. High grade construction and equipment. Length 20 ft.

B. N. MORRIS, 125 State Street Veazie, Me.

ROBERTSON CANOE

None Finer Built

Several models. All sizes. Finest designs, materials and workmanship throughout. I install any make of motor. Motor and War Canoes built to order only. Established in 1881.

Write today for catalog and prices.

J. R. ROBERTSON AUBURNDALE, MASS.

FOR SALE

A Few Second-hand Boats and Engines.

THE NOANK BOAT CO.

Noank, Conn.

TOPPAN POWER DORIES AND MOTORS

Safe. Best Sea Boat Built. $150 up. Send for Catalog.

KNOCK DOWN DORIES, EASY TO BUILD.

Send for Free K. D. Circular and Prices.

TOPPAN BOAT MFG. CO., 21 Haverhill St., Boston, Mass.

Send for catalogue R, describing our Knock Down System. Frames, semi-finished and complete Hulls furnished. Designers and builders of all sizes Motor Boats, Cruisers, Tenders and Auxiliary Yachts. Robertson Bros., Foot of Bay St., Hamilton, Can.

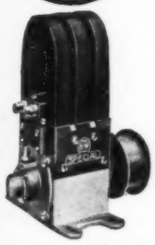
RICHARDSON

Boats of any kind in any stage of construction, knock down or finished.

Write for estimate

G.R. RICHARDSON, Bvecway Street North Tonawanda, N.Y.

SPECIAL
Low Tension
MAGNETO



With 1 Coil for 1-Cylinder, - -	$20.00
With 2 Coils for 2-Cylinders, - -	$25.00
With 3 Coils for 3-Cylinders, -	$30.00
With 4 Coils for 4-Cylinders, - -	$35.00

For Engines up to 4½ bore x 5" stroke, jump spark only.

STARTS THE ENGINE WITHOUT BATTERIES

Install this "K-W Special" Outfit on your boat and learn what it is to be free from ignition troubles at all times.

Larger Magnetos for larger engines. Our $35.00 Low Tension Magnetos run any sized Jump Spark engine when used with a K-W Coil.

K-W Coils $6.00 and $7.00 per cylinder. Fully guaranteed.

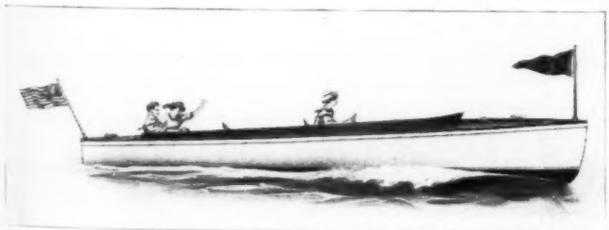
Search Lights, $10.00. Run by K-W Low Tension Magnetos.

K-W High Tension Magnetos Gear drive for racing engines, $50.00, $75.00, $95.00.

Write for Catalogue No. 17; just off the press.

THE K-W IGNITION Co.
2845 Chester Ave. CLEVELAND, OHIO. U.S.A.

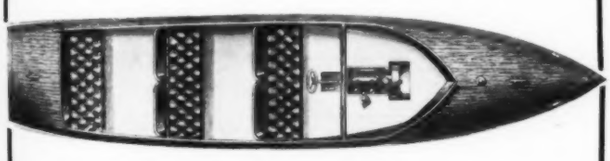
We Pay the Express east of the Mississippi River, or to the Mississippi on points beyond, when cash accompanies the order.



"SUMMER GIRL"

$267.00
BOATING SENSATION

Length 20 feet, width 4 feet 6 inches, depth at mid-section 25 inches.—Mahogany trim, copper fastened throughout, copper fuel tank—right in every particular. Equipped with single cylinder, 2 cycle, 4 H. P. motor.



$323.00

Equipped with 2 cylinder, 2 cycle, 6-8 H. P. motor, reverse gear and auto steerer. Speed 12 miles per hour.

Send for catalogue at once.

Western Launch & Engine Works
1123 East 8th Street Michigan City, Indiana

Utmost Satisfaction

JUDGE them from any angle—durability—ease of manipulation—accessibility—economical running cost—it matters not what, T. & M. Marine Engines measure right up to fullest expectations. They are made in a factory especially equipped with thousands of dollars' worth of special machinery to make them do this. That is why we can give you a real guarantee with every one you buy.

T&M MARINE ENGINES

Start Without Cranking

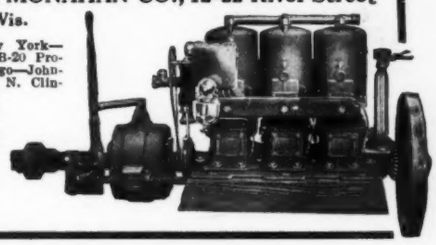
You are off like a flash—can throttle to a crawl—or reverse instantly. There's a type and size for every craft up to 65 feet. Light, medium, and heavy duty. 1, 2, 3 and 4-cylinder, 2-cycle—2 h.p. and up; 2, 3 and 4-cylinder, 4-cycle—12 to 48 h.p. Use gasoline, kerosene or distillate.

Other T. & M. Specialties

Improved Farm Engines, 1½ to 6 h.p. High Grade Pumping Outfits. Electric Light Generator Sets, etc. *Send today for Catalogs.*

TERMAAT & MONAHAN CO., 12-22 River Street
Oshkosh, Wis.

DISTRIBUTORS: New York—Foreign Sales Dept., B-20 Produce Exchange. Chicago—Johnson-Bevington Co., 38 N. Clinton St. Boston—Topsan Boat Mfg. Co., 25 Haverhill St. Philadelphia—W. E. Gochenaur, 631 Arch St. Minneapolis — J. C. Shaddegg Engine Co., 315 3rd St., South. Seattle—Ed. P. Jones, 526 First Ave., South.



Now is the Time to Think About

putting electric lights into your boat for next season.

When you have installed one of these outfits, you will wonder why you have waited so long.

Think of the convenience of having a complete self-contained lighting outfit on your boat. Simply turn a switch and you can flood your cabin with light, turn on starboard, port, low and riding lights.

Dayton Launch Lighting Outfits

can be had in various sizes, to equip any boat from a small launch to a large cabined cruiser. The outfit is complete, and consists of dynamo, storage battery, wiring, lights and controlling switch.

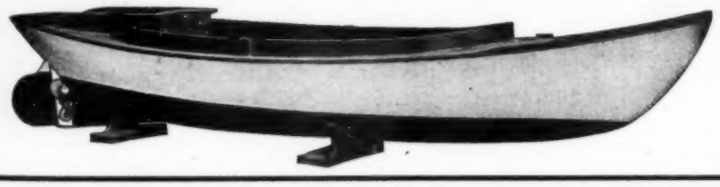
You can also operate a searchlight with our outfit. If you have gotten thoroughly tired of hot, smelly oil lights that go out and blow out just when you need them the most, you should send for our latest bulletins describing our lighting outfit.

THE DAYTON ELECTRICAL MFG. CO.

Largest Manufacturers of Ignition and Lighting Apparatus Exclusively in the World.

186 St. Clair Street Dayton, Ohio

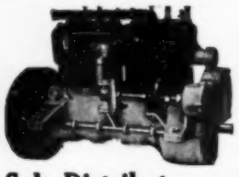
Cape Cod Power Dory Rides the Sea Like a Duck But Never Dives



CABIN DORIES. 22 to 28 feet long. Prices upon application. Cedar planked, smooth OAK KEEL and frames. The largest small boat to be had.

OUR SPECIALS—Cape Cod Power Dory, 20 ft. overall, and Sportsman's Fishing Boat, 16 ft. overall.

Cape Cod Power Dory Company
455 Main Street, Wareham, Mass.



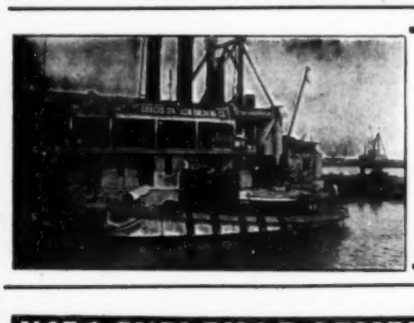
$150-KERMATH-$150

(Made by Kermath Mfg. Co., Detroit, Mich.)

4 Cylinder, 4 Cycle, 3 1-2" x 4" 10-12 H. P.

"The engine you have hoped for"

Sole Distributors: MORTON MOTOR COMPANY : : 47 East Fort Street, Detroit, Mich., U. S. A.



"WOLVERINE"

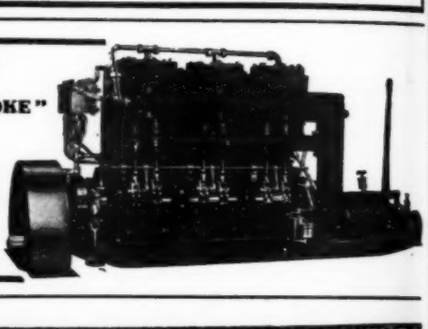
"THE MOTOR WITH THE BORE AND STROKE"

FUELS—Kerosene, Gasoline and Suction Gas
Sizes—5 to 100 H. P. 4 cycle

"EVELYN C", one of a fleet of tug boats owned by a well known dredging company at Galveston, Tex. Equipment 50 H. P. "Wolverine."

Catalog No. 53 Free upon Request

WOLVERINE MOTOR WORKS, Bridgeport, Conn., U. S. A.



USES FUEL THAT OTHERS WASTE — UTICA LONG STROKE KEROSENE ENGINES

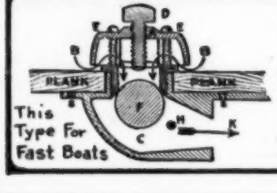
Now Try a Real Kerosene Marine Engine.
Your best interests demand it.

No Danger of fire or explosion.
Will not backfire as no fuel enters the base.
4 port construction. Two ports devoted entirely to fresh air supply.
Economical. Uses 64 parts air to one of kerosene.
Perfect combustion. No waste or carbon.
The only kerosene engine eliminating torch or superheated heads.
Ignition simple and positive. You'll find these advantages in only one two cycle kerosene engine.
Utica Long Stroke Kerosene Engine.
Made in 1, 2 and 4 cycle types, sizes 1¼ to 22 H. P.

Long Stroke: the test proven power increasing feature found only in Utica 2-cycle engines. Investigate this long stroke. It means Long Life, Slower Speed, Less wear on all parts; no vibration and 25% more power from the same amount of fuel.
10-year double service guarantee.
30 days trial in your boat.
Every engine thoroughly tested and shipped ready to install. Write to-day for catalog. Find out about our money-saving plan and how to get free extra power for your boat.
Some excellent territory open for live agents.

XARGIL MANUFACTURING CO., 110 Lafayette Street, UTICA, N. Y.

HITCHCOCK'S AUTOMATIC BILGE BAILER - FOR SLOW AND FAST BOATS



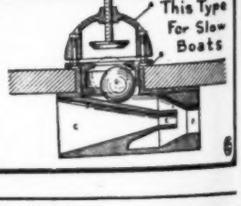
PATENTED

Two types—one for slow boats, six to fifteen miles per hour, and one for fast boats, any speed above ten miles.

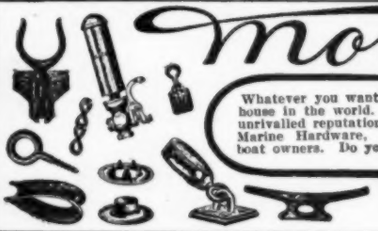
Entirely automatic in action. Takes no power from motor and is not in way in hull. Attached through opening in garboard strake. Made entirely of cast bronze and will outlast the hull. Self-closing when you slow down or stop. Permanently closed by thumb screw D when you wish it. Efficient beyond question.

Write today for information and prices. You need it in your boat.

THE AUTOMATIC BILGE BAILER CO. 119 ST. MARY'S ST. BROOKLINE, MASS.



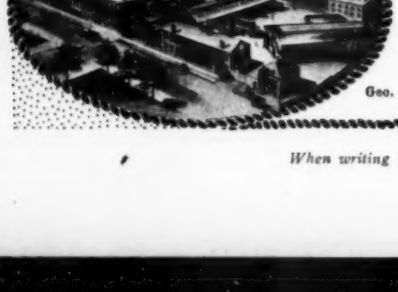
Morss Boat Fittings



Whatever you want in the line of boat supplies, we have the biggest and best assortment of any marine supply house in the world. For sixty-seven years we have been leaders in this line and in that time have built up an unrivalled reputation for quality and service to customers.
Marine Hardware, Accessories, Equipment, Tools, Specialties. We cater to boat builders, supply dealers and boat owners. Do you know the satisfaction of being a Morss customer? Send 6 cents postage for 550-page catalog.

A. S. MORSS CO.
41 HIGH ST., BOSTON, MASS.

Lawley Boats



A SUPERLATIVE TERM SINCE 1866

Steam, Gasoline and Sailing Yachts
Motor Boats, Tenders, Launches, Speed Boats

Wherever quality is appreciated, the standard of perfection in boat building is conceded to the Lawley product.
Tell us your requirements. Inquiry implies no obligation.

Geo. Lawley & Son Corporation, Neponset, Mass., U. S. A.
Cable Address, "Lawley Boston"

1 to 3 Miles Per Hour Increase Guaranteed

Many a motor is being blamed for lack of power, many a boat for lack of speed—merely because they are not equipped with efficient propellers. Before you replace your motor or sell your boat, give it a fair chance with a B. & B. Propeller.

The surest way to secure maximum speed from any boat is to fit it with a genuine B. & B. wheel in the first place. Don't take chances or handicap your boat with anything else.

Whenever you have occasion to buy or specify a propeller, whether it is for an old boat or a new one, remember our standing guarantee, five years old, to increase the speed one to three miles per hour with the B. & B. wheel.

Look for our name stamped on the hub of every genuine B. & B. Propeller and don't be misled by substitutes that look nearly like it. Even if they were cast from identical patterns, no substitute would be equal in material, finish or durability.

Bryant & Berry Company
28 W. Atwater St., Detroit, Mich

The "SHAW" Propeller Makes GREATER Speed

Than Any Other Make!
Drives The Boat On An Even Keel!

Maintains *efficiency* up to 1800 revolutions per minute. Keeps the boat level and on right lines at any speed. Makes perfectly steady sailing—no "jerky" motion—revolution of the engine never varies.

These make for the greatest possible speed and the least waste of power.

The pushing power of the Shaw Patent Propeller gives the necessary efficient resistance for propulsion up to 1800 *or more revolutions a minute.*

The constructive principle of the Shaw Propeller is to push the boat on an even keel, thus preventing dragging the stern down. None other acts like this.

Prices and further details are free for the asking.

Shaw Propeller Company .. Boston, Mass.

STOP and write us for our New Catalogue describing all new and up-to-date Motor Boat Equipment.

REMEMBER

we can supply you with supplies at prices that will surprise you. For quality, ask your neighbor Motor Boat owner who no doubt is one of our many satisfied customers.

WIZARD COMBINATION LIGHT.

This is the highest grade Fresnal Glass Lamp made for Class 1. Has a screen 4 inches in length, which is easily removed when not in use.

Set of two galv. fresnal glass lights for Class 1, as illustrated	$2.10
Set of four galv. fresnal glass lights for Class 2	3.25
Set of four galv. fresnal glass lights for Class 3	4.75
Pol. brass two tone Horn	1.25
Pol. brass Pump Whistle	2.50
8 inch pol. brass Bell	1.20
Ammeter	.89
Volt-Ammeter	1.25
12 in. Steering Wheel with pol. brass trimmings	.95
12 in. galv. Steering Wheel with wood handles	.90
1 pair 3 in. pol. brass Bow Chocks	.20
3½ in. pol. brass Stern Chocks	.12
1 pair pol. brass flush flag pole Sockets 1 in.	.36
Guaranteed Jump Spark Coil	3.25
Electric Whistle outfit	3.60
Brass Bilge Pumps	1.25
1¼ in. Schebler Carburetors	7.50
1½ in. brass Check Valves	1.10
1 in. brass Stuffing Boxes	.60
Primary Cable, per foot	.03
Secondary Cable, per foot	.06
Mica Spark Plugs	.25
Double Throw Fibre Switches	.18

UNIVERSAL STERN LIGHT.

with hinged bottom for Class 1 and 2.

Distributers for Pyke Automatic Boat Drainer, Yankee Mufflers, Kingston Coils, Connecticut Specialties, Columbian Propellers, Schebler Carburetors and Wonder Marine Engines.

Universal Motor Boat Supply Company
Atlantic Highlands, New Jersey

E. J. WILLIS CO.
85 Chambers St. New York
GET NEXT TO OUR CUT RATE PRICES—SEND FOR 1912 RATE CATALOGUE

CORRECT EQUIPMENTS under the New Law for MOTOR BOATS.

Class 1.—Boats under 26 ft.

Combined Fresnal Glass Light, White Fresnal Glass Stern Light, Pot, Brass Signal, 1 Life Preserver and 1 Fire Extinguisher.

Size of Combined Light: Glass 3¾ in. x 3½ in. Height 9 in.

Size of Horn: Height 11 in. Width 3½ in.

Size of Stern Light: Glass 3½ in. x 3 in. Height 9 in.

	List Price	Cash Price
Price for Galvanized,	$10.00	$4.98
Price for Polished Brass,	14.00	6.39

Class 2.—Boats from 26 ft. to 40 ft.

16 square inches required in Glass in Side Lights.
19 square inches required in glass in Bow Lights.
1 Stern Light—White Glass Globe.
8 in. Brass Fog Bell.
1 efficient Fog Horn.
1 Fire Extinguisher.
1 Life Preserver.

Price for Outfit as above.

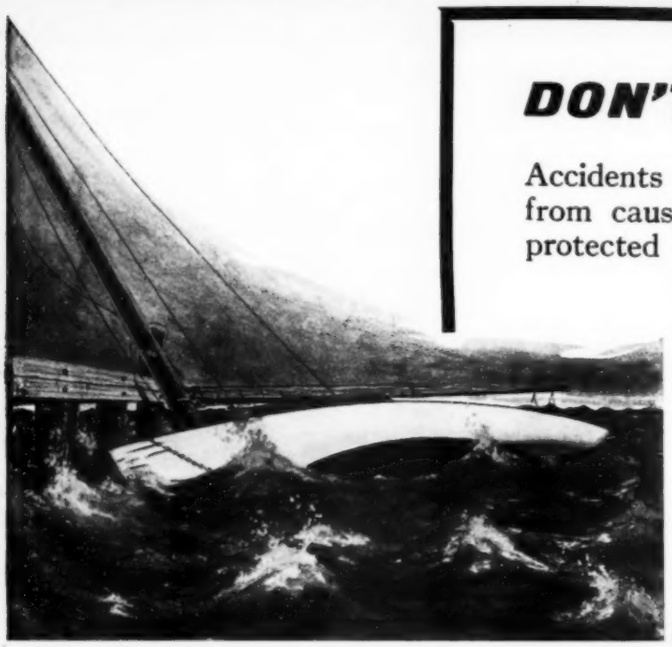
Price for Galvanized	List Price	Cash Price
	$16.00	$8.98
Price for Polished Brass	List Price	Cash Price
	$20 00	$8.98

Class 3.—Boats from 40 ft. to 65 ft.

25 square inches required in Glass in Side Lights.
31 square inches required in Glass in Bow Lights.
1 Stern Light—White Glass Globe.
8 in. Brass Fog Bell.
1 Efficient Fog Horn.
1 Fire Extinguisher.
1 Life Preserver.
1 required for each passenger

	List Price	Cash Price
Price for Galvanized	$18.00	$ 9.75
Price for Polished Brass	25.00	12.75

E. J. WILLIS CO., 85 Chambers St., 67 Reade St., New York.



DON'T TAKE CHANCES

Accidents may happen to your boat any time, from causes beyond your control. You can be protected against loss or damage, however, by a policy in the

INSURANCE COMPANY OF NORTH AMERICA

WALNUT AND DOCK STS., PHILADELPHIA

FOUNDED 1792

CAPITAL $4,000,000. SURPLUS TO POLICY HOLDERS, OVER $8,000,000.

"IT COSTS BUT A FEW CENTS A DAY AND MAY SAVE YOU HUNDREDS OF DOLLARS."

SIMPLICITY SPRAY HOODS **McCLELLAN QUALITY** AUTO BOAT TOPS

Our Motto is "Quality" not Quantity

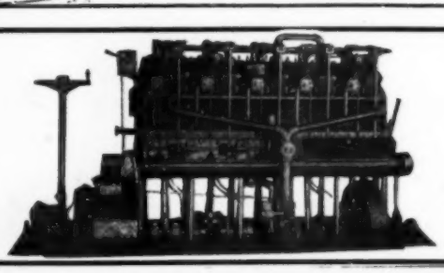
Quality of materials, quality of workmanship and several exclusive features of design give McClellan products an advantage enjoyed by no others.

Simplicity Spray Hoods are used in all U. S. Life Saving Boats. They fit best and last longest. There is no other one make as popular and well known. McClellan Auto Boat Tops are operated without detaching any part of framework, giving true one-man control.

If you want the finest you can buy, investigate the McClellan line. In this case quality is economy.

WRITE TODAY FOR CATALOG

CHAS. P. McCLELLAN, Fall River, Mass.



Gasoline Yachts and Engines

NOTED FOR RELIABILITY
TREGURTHA WATER TUBE BOILERS
STEAM LAUNCHES AND ENGINES
ELECTRIC LIGHT OUTFITS

MURRAY & TREGURTHA CO.

340 WEST FIRST STREET, SOUTH BOSTON, MASS.

Sold Subject to Examination ~ If Dissatisfied Return at Our Expense

Positively the prettiest and easiest starting motor on the market

Single or Double Ignition.
Starts by pressing the button.
2 cycle Valveless, three port.
Fewest moving parts of any practical engine on the market.
Nickel plated throughout, and guaranteed not to rust.
Made in one, two, three and four cylinders, 2½ to 15 H. P.
5 years' absolute guaranty.
Runs as smooth as a sewing machine.
Runs at any speed from trolling to racing.
12 years in business. Never advertised before.
Motors sold themselves.
Demonstrator agents wanted in every boating community.
Special wholesale price on first outfit sold.
Write today for treatise.

NICHOLS & WRIGHT MOTOR CO. :: 48 South Division Street, Buffalo, N. Y.

COSTS NO MORE THAN OTHER MAKES

THE ORIOLE MARINE ENGINE

Built in Baltimore Running Everywhere

More Horse Power—Less Consumption of Gasoline—Than Any Other Heavy-Duty Two Cycle Engine of Same H. P. Rating

5 TO 17 H. P. $110 TO $385

Send for our 1912 Model Catalog A

PAGE ENGINEERING CO. Hull and Cleggett Sts., Baltimore, Md.

"THRU THE TANGLE LIKE AN EEL"

Equip your boat with a STICKLER WEEDLESS WHEEL, the Propeller that never fails, fouls or quits. It's SPEEDY, POWERFUL and ABSOLUTELY WEEDLESS.

TEN DAYS' FREE TRIAL—AGENTS WANTED.

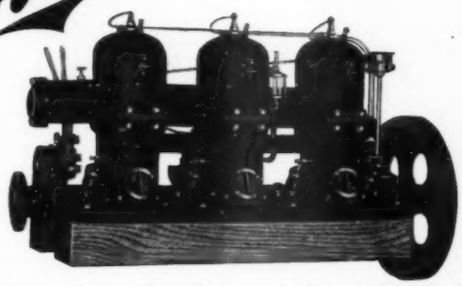
Bronze and iron. Two-blade 10" to 28". Three-blade 16" to 32". All export shipments f. o. b. Atlantic Coast. Order from the nearest point: Norwalk Brass Co., Norwalk, Conn.; Gilson Mfg. Co., Ltd., Guelph, Ontario; or

STICKLER WEEDLESS WHEEL CO., DEPARTMENT A PORTAGE, WISCONSIN

(Write for our free accessory catalog.) ("Stickler" stamped on every bronze wheel.)

When writing to advertisers please mention MOTOR BOATING, *the National Magazine of Motor Boating.*

NEW The Vim FOR 1912



Standard	Heavy Type	Extreme High Speed
Ten types—one to four cylinders. 3 to 36 H. P.	Four types—one to three cylinders, 3½ to 18 H.P.	Five types—two to four cylinders, 13 to 55 H. P.

The Motor that Can't Backfire

The new Vim engine for 1912 is the result of many years of experience and improvements. It is of the same sturdy construction that has always characterized Vim engines, but shows a number of important improvements.

The simplicity of the Vim is too well known to require comment here, except to say that the new model is as simple as its predecessors.

THE IMPROVEMENTS ARE NOTEWORTHY

Non-backfire device that renders backfiring absolutely impossible under any conditions. Corrugated flywheel rim to facilitate easy starting. Magneto and battery ignition through separate spark plugs. Convenient lever control of spark and gas. Water-jacketed exhaust manifold and pipe. Solid cylinder heads—preventing leakage and loss of compression. A lubrication system by which the oil goes into the cylinders in a fine spray with the gas.

We sincerely believe that no other boat engine affords these advantages, coupled with the sturdiness, simplicity and reliability that have given the Vim its high repute. The new catalog describes them in detail.

THE VIM MOTOR COMPANY

4 WATER STREET, SANDUSKY, OHIO

REPRESENTATIVES: Southeastern New York, Connecticut and Northwestern New Jersey—F. A. Baker & Co., 10 Warren Street, New York, N. Y.; Portland, Me.—G. D. Thorndike Machine Co., Portland Me.; Central New York—W. D. Dunning, Syracuse, N. Y.; Quebec, Canada—I. L. LaFlour, Ltd., 365 Notre Dame St., Montreal, Quebec; Oregon—Gas Power and Supply Co., Portland, Ore., Hawthorne Avenue.

The Ideal Launch

Ideal Launches are speedy, safe and seaworthy. Roomy—yet trim. There's a lifetime's expert knowledge and skill behind every Ideal Launch. Dependable for a day's outing or an ocean voyage. No better sea boats can be built. Made in 16, 18 and 20 ft. sizes. Every Ideal Launch contains the great

Gile Marine Engine

This world-famous 2-cycle engine starts, stops and reverses with one lever—a marvel of simplicity. A child can run it. It's the envied engine of the motor world. Every boat fully guaranteed and ready to run.

Send for Beautiful Book

Our new boat and engine book is what you need. Send for it to-day. It's full of good boat and engine information. It will save you money and trouble. Act *NOW*.

GILE BOAT AND ENGINE CO.

406 MAIN STREET, LUDINGTON, MICH.

VIPER

Trade Mark registered in U. S. Patent Office.

Viper IV Type

The first shoal draught speed boat. Entirely weedless. Surface propellers and side-plate rudders. Hickman patents. Half the draught of the screw-propeller. Speed unaffected by heavy weed growths.

No stern wheel. No tunnel stern. No screw propellers. No shaft under water. No strut. No non-lubricated outboard bearing. No projecting rudder. No rudder-stock, brackets, quadrant, tiller rope or pulleys. No torque.

VIPER IV

Viper III Type
Low-power Viper

The fastest hull for low and moderate powers yet devised. Built under the supervision of the designers. We are sending these boats to all parts of the world.

Write for free Viper treatise and illustrated description of surface propeller boats.

The Viper Co., Ltd., Pictou, Nova Scotia, Canada

CROCKETT'S
MARINE VARNISH SPECIALTIES

Since 1868 the reputation of all Crockett finishes has been built upon the solid rock of quality. Cutting the quality to lower the price may be all right for manufacturers who have to meet cheap competition—but the quality of Crockett Specialties has always been above competition.

The conditions of marine service afford the most severe test of varnish known. Ordinary preparations and finishes cannot prove satisfactory for either exterior or interior use. It is unsafe to use any varnish not especially prepared for marine work.

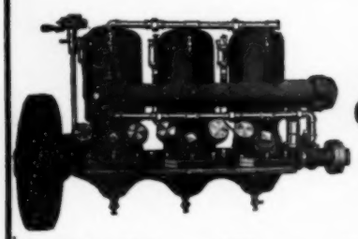
The one way to insure satisfaction is to use genuine "Crockett's Varnish" in the first place. Crockett's Spar Composition for exterior work and Crockett's No. 1 Preservative for interiors have been proved by long use to be the best for their purpose of any varnishes on the market. Other Crockett products bear the same reputation because every one is made especially for the class of service in which it is to be used.

When you specify the use of Crockett's Varnish or other Specialties remember there is nothing "equally as good," so insist upon having the genuine. It may cost a trifle more per gallon, but it costs considerably less if you consider duration and quality of service.

WRITE FOR CATALOG.

THE DAVID B. CROCKETT COMPANY

Bridgeport, Conn., U. S. A.



Toledo

Marine Motors

"Nothing Cheap But The Price"

No need to pay fancy prices when you can buy a high-grade, guaranteed motor, backed by a responsible firm, at prices shown below. You don't get die-cast interchangeable bearings of nickel babbited, bronze plunger pumps, elevated timer, driven by bronze bevel gears, drop forged shafts and connecting rods, Schebler Carburetor and other high-grade equipment with a *cheap* motor, but you get all these with the TOLEDO, and many other good features, all described in our catalog "S," which will be mailed free to anyone desiring it. We equip our motors with "Wico" igniters, making engines self-sparking, at a small extra cost.

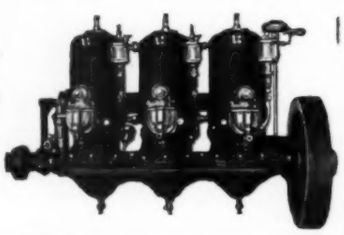
3 H. P. 1 cylinder, 3½ x 3½, complete	$ 65.00
6 H. P. 1 cylinder, 4½ x 4½, complete	84.00
6 H. P. 2 cylinder, 3½ x 3½, complete	125.00
12 H. P. 2 cylinder, 4½ x 4½, complete	160.00
18 H. P. 3 cylinder, 4½ x 4½, complete	250.00

UNIVERSAL MACHINE CO.

1600 Hicks Street
BOWLING GREEN, OHIO

New York Agents,
E. J. WILLIS CO., 85 Chambers St.

Chicago Agents,
BULLOCK ENG. CO.
1407 Michigan Avenue



"No'No'th East By No'th"

USE THE Compass

and you can always reckon the *true* magnetic North. It is the result of years of accumulated experience. It is built not only to be true when first used, but also to maintain that accuracy for an indefinite period. It withstands the jar of power craft and the buffeting of heavy seas. It is an oil compass, absolutely guaranteed by the monogram in the north point to be dependable under any and all atmospheric and sea conditions. The dial remains steady enough in a seaway always to indicate course, yet responds at once to any change in direction of craft. Bowl of non-porous brass-cast, coated inside with white composition that will not turn yellow; flexible diaphragm allowing for slight contraction and expansion of liquid; the card is exceptionally light in weight, supported by **jeweled** bearings on hardened steel pivot, reducing friction to the minimum, assuring accuracy, free movement always.

If your dealer does not carry the compass, write us and we'll give you name of nearest dealer who does. *FREE—Our New Celluloid Course Protractor, to boat owners. Send for one.*

Wilcox, Crittenden & Co., Inc., Est. 1847

Largest and oldest makers of Marine Hardware in the world

MIDDLETOWN, CONN.

"SUMMER GIRL"

$490.00

Get information on this boat--you'll find it what you want

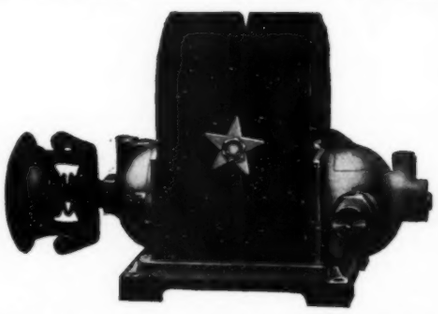
It will give you more pleasure—more style—more comfort—more speed—**much more value than any ever offered.**

Length, 25 feet; width, 5 feet 2 inches; depth at mid-section, 28 inches. Mahogany trim, copper fastened throughout, copper fuel tank—right in every particular. Equipped with a **4-cylinder, 4-cycle motor** and **full automobile control.**

Western Launch & Engine Works
1120 East 8th St., Michigan City, Ind.

The Best is None Too Good for Your Engine

We Have It---THE COMET



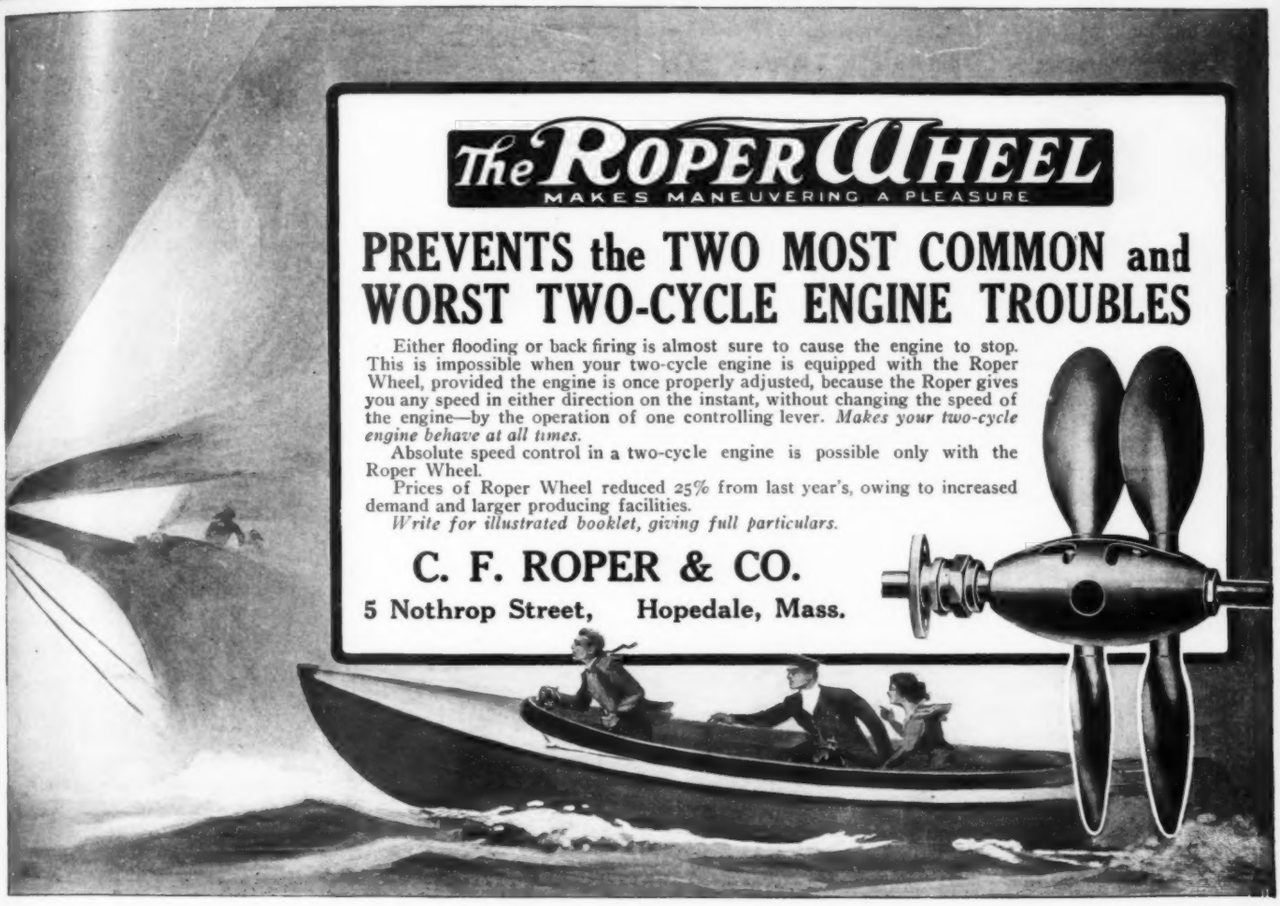
The simplest, most compact and powerful magneto made. It is not a radical departure from accepted practice, but leads all others in features of simplicity, which is the very keynote of our design.

SPECIAL PRICES

For Make-and-Break Spark	$10.00
For Make-and-Break Spark with Coil	11.00
For One or Two Cyl. Jump-Spark	11.00
For One Cyl. Jump-Spark with Coil	14.50
For Two Cyl. Jump-Spark with Coil	17.00
For Four Cyl. Jump-Spark	15.00
For Four Cyl. Jump-Spark with Coil	24.00
For Auto or Boat Ignition and Light	25.00

Thirty Days' Trial. Order To-day

HENRICKS NOVELTY CO.
300 W. Georgia St., Indianapolis, Ind.



The ROPER WHEEL
MAKES MANEUVERING A PLEASURE

PREVENTS the TWO MOST COMMON and WORST TWO-CYCLE ENGINE TROUBLES

Either flooding or back firing is almost sure to cause the engine to stop. This is impossible when your two-cycle engine is equipped with the Roper Wheel, provided the engine is once properly adjusted, because the Roper gives you any speed in either direction on the instant, without changing the speed of the engine—by the operation of one controlling lever. *Makes your two-cycle engine behave at all times.*

Absolute speed control in a two-cycle engine is possible only with the Roper Wheel.

Prices of Roper Wheel reduced 25% from last year's, owing to increased demand and larger producing facilities.

Write for illustrated booklet, giving full particulars.

C. F. ROPER & CO.

5 Nothrop Street, Hopedale, Mass.

This is the GIES REVERSE GEAR fitted with detachable cover

Without Covers

Special No. 1
(for engines developing up to 1 1-2 H. P. per 100 rev) **$12.00**

Model "A"
(for engines developing 1 1-2 H. P. to 2 1-2 H. P. per 100 rev.) **$24.00**

Model "B"
(for engines developing 2 1-2 H. P. to 4 H. P. per 100 rev.) **$48.00**

Covers to Fit

1909-1910-1911 and 1912 Models

Special No. 1	$1.50
Model "A"	2.50
Model "B"	3.50

Ask for Catalog B

GIES GEAR COMPANY, 49 Fort Street, East, Detroit, Mich.

INCREASE the POWER of your ENGINE—NO BATTERIES Needed

MOTSINGER
AUTO-SPARKER

Will Generate Electricity for Ignition and Electric Lights, Charging Batteries, etc. Suitable for all types and sizes of Gasoline Engines.

Jump Spark or Make and Break. Water and Dust Proof. Fully Guaranteed.

CHEAPER THAN BATTERIES
It will do for Your Engine

what the High Tension Magneto is doing for the Automobile.

Let us tell you how to make your own electricity for both ignition and lighting.

Free book gives complete details.

MOTSINGER DEVICE MFG. COMPANY 358 FIRST AVENUE LAFAYETTE, IND.

Whatever you want—motor boats, canoes, cruisers, engines, supplies, accessories—Shad can save you a lot of money and a lot of time. Ask him.

Write today for Catalog A. It will only cost a cent and may save you many dollars

SHADEGG BOAT & ENGINE CO.
315-17 Third Street, South
MINNEAPOLIS MINN.

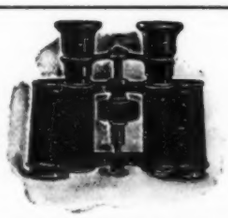
KRICE Carburetor 20% More Power

30 DAYS TRIAL

We absolutely guarantee the Krice Carburetor to use less gasoline—give better control and 20% more power. Your money back if it doesn't.

The only sure way to know that you are getting *all* the power from your engine is to try a Krice Carburetor Write today for literature.

KRICE CARBURETOR CO.
2 Charlotte Ave., Detroit, Mich.



THE VISIOSCOPE STEREO-BINOCULAR
Power 7 Times

This glass is especially adapted for marine use. It has a very large, clear field, brilliant illumination, and depth of focus. The Price is $33.75.

RELIABLE DEALERS SUPPLIED

Pinkham & Smith Company
288-290 Boylston Street 13½ Bromfield Street
Boston, Mass.

ELASTIC SEAM COMPOSITION
TRADE MARK

For deck and all other seams

Put up in 12½, 25, 50 and 100 lb Kegs. White, Gray and Yellow, Black and Special Colors, 15c per lb.; 1, 2 and 5-lb. cans, 18c per lb. 2-lb. trial package, with Seam Paint, 50c; trial package, with Seam Paint, $1.25.

ELASTIC GLOSS YACHT WHITE

The whitest gloss white in existence. Works as smooth as oil paint. Dries in from 4 to 8 hours. Withstands acids and gases, will retain its gloss the entire season. Can be touched up any time without showing. One coat over a coat of Elastic Flat Yacht White will retain its gloss all season. Price $4 a gal.; half gal. $2; quart $1.

ELASTIC FLAT YACHT WHITE

It is the whitest yacht white. In spreading and covering unsurpassed. Dries in 2 to 4 hours. Withstands acids and gases. Withstands hard usage and scrubbing. Two coats last all season. Price, $3.00 a gal.; $1.60 a half gal.

ELASTIC SPECIAL BRIGHT GREEN AND RED COPPER PAINT { $3.00 per gal. / $1.50 ½ gal.
ELASTIC SPECIAL BRIGHT GREEN BOOTTOPPING.....$3.50 per gal.
ELASTIC GRAY TROWEL CEMENT.....$3.00 per gal.
ELASTIC WHITE TROWEL CEMENT.....$3.50 per gal.

Agents Wanted in each seaport town.

H. B. FRED. KUHLS, Sole Manufacturer
(Successor to Cole & Kuhls)
Office and Works—722 3rd Ave., Borough of Brooklyn, NEW YORK, U. S. A.

Packard CABLE

IS THE PUBLIC'S CHOICE
FOR
Lasting Ignition and Lighting Service
Why? "Ask any User!"

WANT NEW 2-COLOR CIRCULAR?

The Packard Electric Company, 322 Dana Ave., Warren, Ohio

1912 Annual Catalog No. 22

Our 1912 Catalog, the Largest and Most Complete Catalog of the kind, containing 256 pages, is Now Ready For Distribution. The Circulation is Limited to ONE HUNDRED THOUSAND Copies. It will be mailed to ANY ONE ON REQUEST.

Cut Prices

Concerns that offer Large Discounts make it their practice to INFLATE LIST PRICES and then offer Large Discounts, which are somewhat misleading. We have seen a catalog in which a certain spark plug is illustrated, "PRICE $2.50, OUR PRICE, $1.00 while THE STANDARD LIST or RETAIL PRICE for the same spark plug as illustrated in Our Catalog and advertised by the manufacturers is $1.00 each. Their CUT PRICE Therefore Is Not Lower Than OUR LIST PRICE.

DON'T BE DECEIVED
By Large Discounts Quoted from Inflated List Prices

[ORDER FROM OUR NEAREST] BRANCH
The Largest Auto Supply House in America

CHAS. E. MILLER, Manufacturer, Jobber, Exporter and Importer
Home Office: 97 to 103 Reade Street, - - New York City
BRANCHES: Philadelphia, Boston, Cleveland, Detroit, Buffalo, Hartford, Atlanta, Brooklyn, Albany, N.Y., New York City, New Orleans, La., Newark, N. J., Springfield, Mass.

A NEW PRIMING COCK

This little priming cock in the cylinders of your motor will prove the most convenient device you ever tried. Appeals to every motor boatman upon sight.

Made partly from steel, and is positively guaranteed against leaking, sticking, seizing, or breaking of handles.

Has large opening to help in timing motor.

Send for one to-day. You'll never be without.

	⅛-in.	¼-in.	⅜-in.
Short Type	.45	.55	.75
Long Type	.55	.70	$1.00

MORGAN MFG. COMPANY
JOHN ST. NEWPORT, R. I.

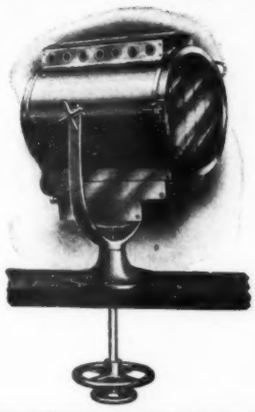
ELECTRIC SEARCHLIGHTS

Send TODAY for Catalog "A" Containing Valuable Information About Modern Lighting Plants.

We have equipped some of the finest power boats, yachts and launches afloat with Direct Connected Generating Sets. All leading ship and launch builders use them, because they are unequaled in brilliant, dependable service.

Searchlights in designs from 7 in. to 60 in. diameter.

Let us tell you about our big line.



The Carlisle & Finch Co.
261 East Clifton Avenue
CINCINNATI, - - OHIO

SANBORN

Marine Speedometer

Invaluable in darkness or fog. Helps in navigating strange waters by showing exact speed, from which you can figure distances, tides, currents and locations. It enables you to experiment with different equipments, such as motors, ignition, carburetor adjustment, oils, greases, propellers, etc., until you have poyr while boat tuned up to the highest pitch of efficiency.

Write today for information.

AMERICAN STEAM GAUGE & VALVE MFG. CO.
BOSTON, MASS.
New York Chicago Boston Atlanta Pittsburgh

"GURNET" DORY

THE SEA GOER

Lengths from 16 to 30 feet. Safe, Silent and Non-Sinkable.

SPEED AND EXPRESS BOATS ALSO

Illustrated folder on request when stating requirements.

THE ATLANTIC CO., AMESBURY, MASS.
NEW YORK: 30 Church St. **BOSTON: 93 Haverhill St.**

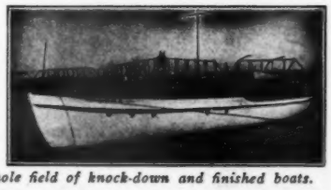
Build Your Own Boat

This picture shows one of our 45 ft. cabin cruiser frames ready to take apart and crate for shipment. Everything is done right up to the point where planking is to be put on. One man can reassemble this frame and have it ready for planking in six hours' time. Any man, experience unnecessary, can finish this boat and fit it with power for less money than he would have to pay for the cheapest 25 ft. cruiser offered by any manufacturer of completed boats to-day. We carry a full line, from the canoe to the 65 ft. cabin cruiser.

Our Finished Boats

You may not have time to build your own boat. Cabin cruisers are our specialty. Write us and we will convince you that other manufacturers cannot meet our prices on finished boats. Let us quote on your specifications for a boat of any type.

The superior excellence of our designs; beauty, seaworthiness, and speed in our boats; and a square deal and popular prices have brought us in the past five years from a small, unknown factory to rank among the largest and best known builders of both knock-down and completed boats in the land.



We make a specialty of knock-down frames for large cabin cruisers, but as a result of our frame business, can quote prices on finished cruisers that cannot fail to interest.

Get our free catalog which covers the whole field of knock-down and finished boats.

DEFOE BOAT & MOTOR WORKS, 3216 STATE STREET BAY CITY, MICH.

THE OCTA LOG

FOR PLEASURE BOATS

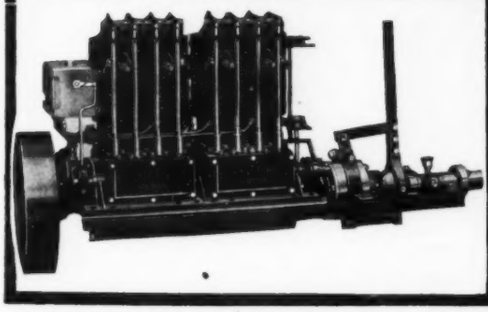
A practical, ball-bearing, taffrail log, which records accurately speeds up to 15 knots an hour.

Indicates to a hundred miles by tenths on its 3-inch dial—easily read. Price $10.00 complete, including 100 feet of line.

JOHN E. HAND & SONS CO.
222 WALNUT ST. PHILADELPHIA

Sole Makers of "Hand" Steering Pedestal Binnacles

FRISBIE



3 to 75 H.P.

A New Model, just out, four cylinder 12 H. P.

A postal will bring information worth having.

Frisbie Motor Co.
Middletown, Conn.

MOOR YOUR BOAT TO A BULB SHANK MOORING ANCHOR

and you won't find her up on the beach or down the river after the next bad blow.

When you note a boat owner trying to get the club janitor on the 'phone the morning after a heavy storm, you can make a safe bet that his boat wasn't tied to a bulb shank.

The bulb on the end of the shank makes the anchor lie flat. When a sudden strain comes on the chain, the shank rises and relieves the strain. The partitions in the head prevent its balling up with mud, and the eye for the trip line allows you to get the mooring up at the end of the season without the use of a derrick.

Our free "Mooring Book" will tell you about this anchor. Send for it now.

Fairhaven Iron Foundry Co., No. 2 Water St. Fairhaven, Mass.

Agents: New York, C. D. Durkee & Co., 2 & 3 South St.; Boston, A. S. Morss Co., 43-45 High St.; Chicago, Geo. B. Carpenter & Co., 430-440 Wells Street

Complete Outfit, $31.00 Net Cash

GUS. A. DIEM, 20 Fulton St., New York City

EVERYTHING *in* CANVAS

As a result of 60 years' successful experience, we are headquarters for

Marine Supplies

of all kinds—all the necessities for rowboat, yacht or motor boat, at maker's prices.

Send 22c to cover postage on 400-page catalog on marine hardware, sails, tents, canopies, awnings, flags and club pennants — we'll refund on first order.

F. Vanderherchen's Sons
7 N. Water Street, Philadelphia

ANYTHING *for* A BOAT

THE IMPROVED **BALL REVERSE GEAR for MOTOR BOATS**

Made only of
HARDENED STEEL SPUR GEARS

Patented
Ap'l 9, 1901
Nov. 3, 1902.
Jan. 12, 1904

Most Reliable
Highest Grade
Easiest to Install

Four Sizes Carried In Stock
Send For Catalog

New York Gear Works
56 Greenpoint Ave., Brooklyn, N. Y.

WHITE MOTOR AND PADDLING CANOES

THE IDEAL CRAFT FOR FISHING—LIGHT, WIELDY, SWIFT

So easily handled that a twist of the paddle will prevent the gamy fighter from fowling the line against the canoe and spitting out the hook.

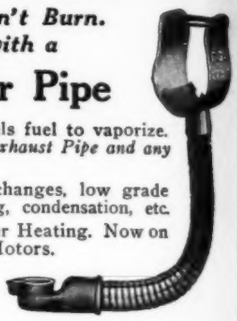
If you are a lover of outdoors you should indulge in the poetry of motion—canoeing.

Write to-day for catalogue; it is in itself a breath from the "out of doors."

E. M. WHITE & CO.
OLDTOWN, • • • MAINE, U. S. A.

Atmospheric Moisture Doesn't Burn. Dry the Carbureter Air with a

Col-Mac Hot-Air Pipe



which cuts out moisture and compels fuel to vaporize. *Fittings for any Carbureter, any Exhaust Pipe and any Motor.*

Prevents trouble from climatic changes, low grade gasoline, carbureter loading, freezing, condensation, etc.

Only positive method of Carbureter Heating. Now on best Marine, Auto and Stationary Motors.

Retail Price $3.00

Gets results or money back

Write for circular.

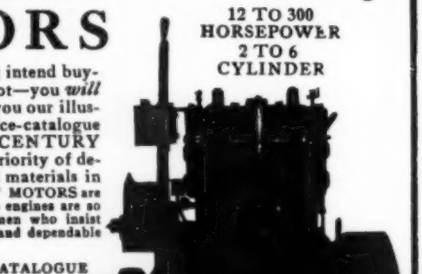
In ordering, state diameter of exhaust pipe, length of tubing and year, model and make of carbureter for which outfit is required.

Send ten cents for "Engine Trouble" text book. Contains remedies for every motor trouble. Saves dollars and reduces up-keep cost.

BREEZE CARBURETER CO., NEWARK, N. J.

Twentieth Century MOTORS

12 TO 300 HORSEPOWER
2 TO 6 CYLINDER



No matter whether you intend buying an engine now or not—you *will* sometime—let us send you our illustrated, descriptive, price-catalogue of TWENTIETH CENTURY MOTORS. The superiority of design, workmanship and materials in TWENTIETH CENTURY MOTORS are the reason why these marine engines are so widely used by motor-boatmen who insist on having the most durable and dependable motor made.

WRITE TODAY FOR CATALOGUE

NEW YORK YACHT, LAUNCH & ENGINE COMPANY
Morris Heights, N. Y.

SPLITDORF MAGNETO

"Always There"

C. F. SPLITDORF

Walton Ave. and 138th St., NEW YORK

CHICAGO DETROIT BOSTON KANSAS CITY LOS ANGELES SAN FRANCISCO

WICKER CHAIRS

that are **Life Preservers.** The chair illustrated in this advertisement can be fitted with a **life belt.** These chairs are creating a sensation with the Yachting Public. Write for catalogue and full information.

Wicker-Kraft Company
15 So. Water Street Newburgh, N. Y.

TRUSCO PROPELLERS

Trusco Spark Plugs, Ignition Cable, Spark Coils, Magnetos, Rear Starter, Air Compressor, Anchors, Bilge Pump, Sailing Lights.

TRUSCO WHEELS are designed expressly for your boat and engine if we are unable to furnish a wheel suited to your outfit from our 250 patterns. We have been making propellers more than 20 years. Write us a description of your hull and engine. The TRUSCO spark plug is guaranteed for life. Price $1.00. 208-page catalog for 10 cents to cover postage.

TRUSCOTT BOAT & AUTO SUPPLY CO., BOX 294 ST. JOSEPH, MICH.

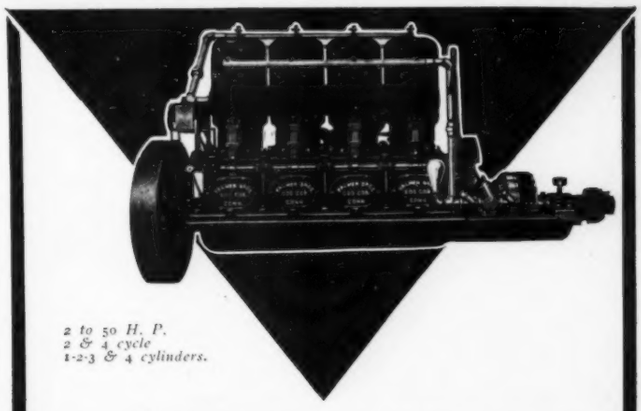
HIGH GRADE

PLEASURE - BOATS

RUNABOUTS.

Let us submit you a design
State size, type and speed you desire
WRITE TODAY

MILWAUKEE YACHT & BOAT CO.
MILWAUKEE, WIS.



2 to 50 H. P.
2 & 4 cycle
1-2-3 & 4 cylinders.

PALMER MOTORS

The other fellow's experience is a good thing to have. Find a Palmer user and ask him what he knows. It's a pretty safe way to buy a motor.

"500 Motor Boat Facts" pocket edition, sent free with separate catalog. Address Dept. B.

PALMER BROTHERS, Cos Cob, Conn.

BRANCH OFFICES

New York, 31 E. 21st St.
Philadelphia, 34 No. 6th St.
Boston, 77 Haverhill St.
Providence, R. I., 242 Eddy St.
Portland, Me., Portland Pier
Baltimore, Md., 126 Market Place

MECHANICS MARINE MOTORS

A LINE OF TWO CYCLE MOTORS OF THE COMBINATION TWO- AND THREE-PORT TYPE EQUAL IN EFFICIENCY—RELIABILITY—ECONOMY

TO ANY MOTORS MADE, AND

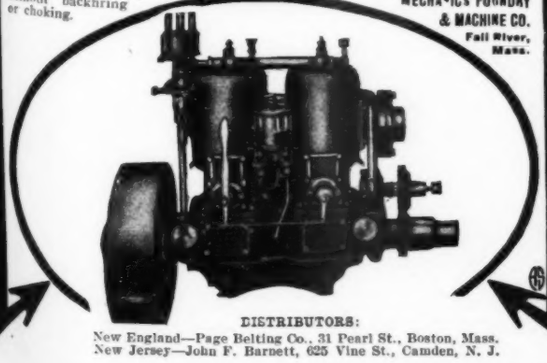
As Flexible as any FOUR-CYCLE MoToR

A distinct advance in two-cycle design and performance is achieved in Mechanics Motors. Exceptional flexibility is secured by our auxiliary air valve arrangement and correct proportioning of the ports. Mechanics Motors can be throttled down from 1,000 to 150 r. p. m. without backfiring or choking.

If you want a motor for steady, reliable service, year in and year out, you need a Mechanics Motor. Don't buy any until you have investigated this one. One to six cylinder, 5-45 H. P.

Write today for our illustrated catalog.

MECHANICS FOUNDRY & MACHINE CO.
Fall River, Mass.



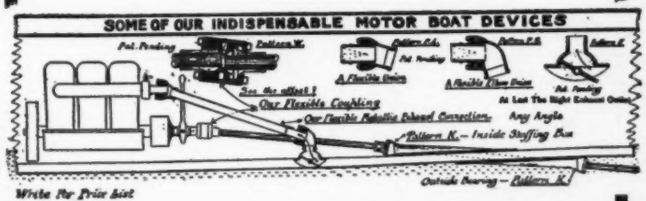
DISTRIBUTORS:
New England—Page Belting Co., 31 Pearl St., Boston, Mass.
New Jersey—John F. Barnett, 625 Vine St., Camden, N. J.

Is Your Motor Handicapped?

No motor can give full satisfaction when improperly installed. Every hull bends when driven against the pressure of the water; if motor and propeller shaft are rigidly connected to hull, the shaft bearings are sure to be thrown out of alignment. This eats up your power by causing binding of the shaft and great strain and wear on the bearings.

A New Era in Motor Installation

Our **Automatic Aligning Shaft Bearings** overcome this, deliver full power to the propeller and prevent strain on the motor. They save power, save wear, save trouble, and best of all, are quick and easy to install. Various models for all different types of boats. Used by the best boat builders and the most experienced boatmen.



Weeds Can't Foul a "Fishtail" Propeller

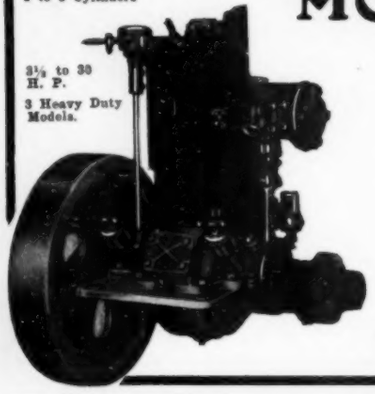
For all around use the Fishtail is the best wheel made because it is both weedless and speedy. Some of our customers use them for racing and they win. Solve your wheel troubles this year by getting a Fishtail. Let us prove it.

Write today for catalog of Marine Specialties. Contains valuable information and descriptions of the above. You need it. Get it.

Mechanical Devices Co., WATERVLIET, NEW YORK

Treat Yourself to the Superior Service of a Genuine

11 Models
1 to 3 Cylinders



3½ to 30
H. P.
3 Heavy Duty
Models.

MOHAWK MOTOR

Two Cycle, Three Port and
Combination Two and Three Port

If you want a motor that will run hour after hour under full load, day in and day out without trouble, you should buy a genuine Mohawk Motor. There are other good motors, but none can excel the Mohawk in power, durability and reliability. It is a masterpiece of superiority in design, material, workmanship, finish and serviceability. And in addition to its recognized quality, our modern machinery, special tools and improved manufacturing methods make it the *lowest-priced high-grade motor on the market.*

Auxiliary air intake greatly increases efficiency and power. Double ignition increases power 15 to 20%. Water-jacketed exhaust manifold with provision for direct exhaust.

Get our catalog before you purchase any other motor. Write to-day.

THE S. R. MFG. CO., SCHENECTADY, N. Y.

THE HOUSEBOAT LANAI

—the 70-footer which has been hailed in Florida as the houseboat marvel of the year in comfort, speed and ability to ascend inland streams. Simply another proof of the advantages of Mathis specializing on boats of less than 120-ft. and of our unequalled facilities and location for such work. Write for details.

MATHIS YACHT BUILDING CO.

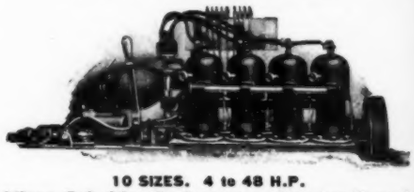
Specialists in 60- to 120-ft. Cruisers and Houseboats

Cooper's Point, Camden, N.J.

Builders of the famous shoal houseboats —
COCOPOMELO,
EDNADA III,
LODONA,
LUNARIA,
and LANAI.

ROCHESTER ENGINES

HAVE BEEN BUILT FOR 12 YEARS



10 SIZES. 4 to 48 H.P.

Detroit Oilers, Schebler Carburetors, Atwater Kent Ignition

All bearing bushings adjustable and interchangeable, made of **Parsons White Brass.** Oil ring to lubricate connecting rod. Sight feeds on lubricator, so that the amount of oil feeding can be seen. Piston rings that hold compression. Cylinders, rings and all bearings ground to a perfect fit. *Write for Information.*

ROCHESTER GAS ENGINE COMPANY, 106 Platt Street, Rochester, N. Y.

FOR SAFETY AND ECONOMY

Use Samson Tiller Rope

Mahogany colored cotton cord braided over a flexible center of phosphor bronze or galvanized steel wire. Guaranteed free from imperfections. Hard smooth finish that will not roughen up and wear out quickly like common tiller ropes. Backed by 40 years' experience.

Write for Catalog.

SAMSON CORDAGE WORKS, BOSTON, MASS.

HOWARD ENGINES

Stock Sizes, 4-Cylinder

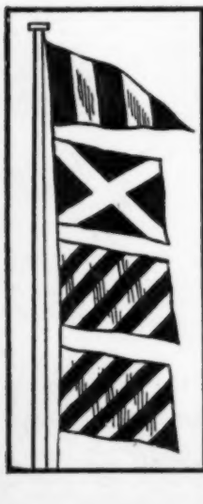
3½x5¼	en-bloc.
4x6	en-bloc.
4¾x6	Twin casting.
5½x6½	Twin casting.
6½x7	Twin casting.

Stock Sizes, 6-Cylinder

4x6	3 en-bloc.
4¾x6	3 en-bloc.
5½x6½	3 en-bloc.
6½x7	3 en-bloc.

Our engines are intended for that class of trade which desires to combine for a better line of work than the usual commercial engine which is sold in close competition, price being the leading feature. No old patterns.

New York Motor Works, Inc., AVONDALE, N. J.



→S. & M.←

MARBLEHEAD ANTI-FOULING GREEN

WHITE or BRONZE

The most powerful anti-fouler and preventive of marine growth, barnacles and borers ever produced. A brilliant and beautiful shade of light green—A clean, smooth, slippery surface—Great durability and economy of upkeep. In tropical waters it is the only substitute for copper sheathing as a protection against Teredos. Non-corrosive. Will protect both wood and steel.

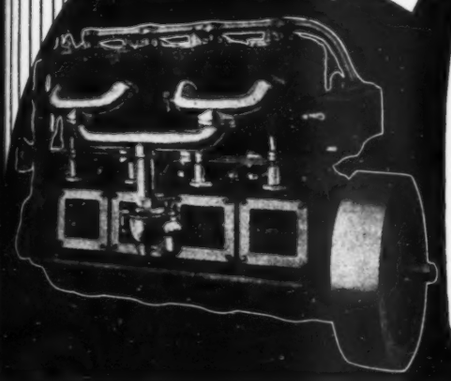
For the Bottom of Racing and Cruising Yachts and Launches

ABSOLUTELY GUARANTEED

FOR TOPSIDES—Yacht White and Yacht Varnish Black. Deck Paint of All Colors

STEARNS-McKAY MFG. CO. MARBLEHEAD, MASS. U. S. A.

Anderson ENGINES



BE FAIR TO YOURSELF

Get the Facts Before You Buy

We can prove the following four points to your satisfaction:

Anderson Low First Cost.
Anderson Low Fuel Cost.
Anderson Low Upkeep Cost.
Anderson HIGH performance.

Provided,—that you give us the opportunity.

Will you? Write today.

In use in nearly every country on the globe.

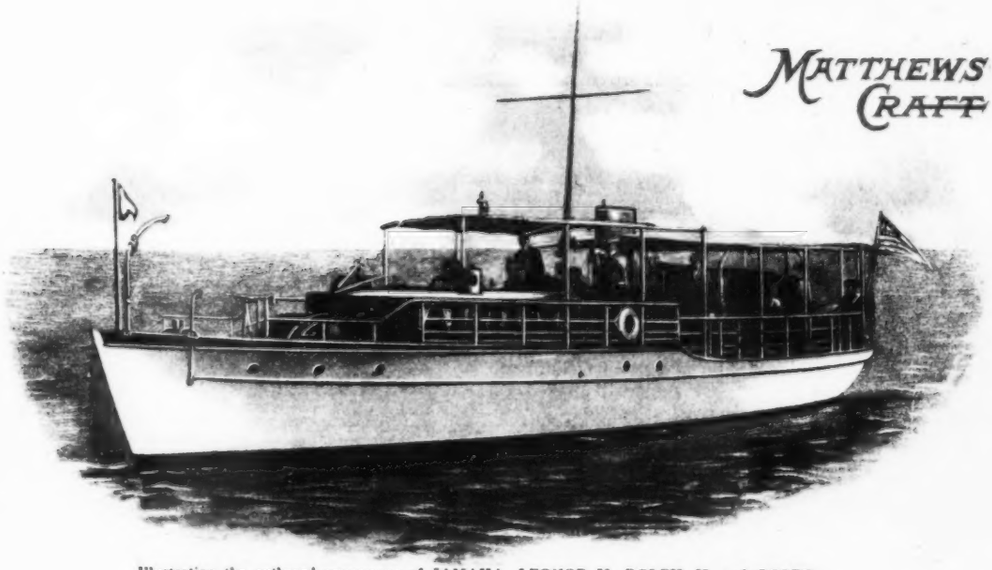
ANDERSON ENGINE CO.,

160 N. 5th Ave., Chicago
Factory, Shelbyville, Ill.

MOTOR BOATING

MATTHEWS CRAFT

ASK AN OWNER



Illustrating the outboard appearance of JAMAHA, LEONOR II, DOLPH II, and OCOEE.

After a year's service, the owner of the JAMAHA writes as follows:

hews Boat Company,
Port Clinton, Ohio.

Detroit, Mich.
March 8, 1912.

lemen:

knowledging and replying to yours of the 7th inst., which was in answer to mine
e 5th, regarding the JAMAHA, it is only with the idea of later building another
larger, that I am offering the JAMAHA for sale.

better hull was ever built, and after the experience that I had last Summer, I
d be willing to cross the ocean in the boat providing we could carry enough fuel.

I should think it would be very easy to demonstrate to anyone who knows anything about yachting that the JAMAHA is a practical, roomy, seaworthy, handy, fine finished yacht in every way, and I do not see how anyone could be disappointed in her. I regret disposing of her, and it is only from the fact that I expect to tour in Europe this season and with the idea of building a larger boat for another season, that I am offering the JAMAHA for sale.

With kind regards and best wishes to you all, I am,

Sincerely yours,

(Signed) H. W. KANOUSE.

Mr. Kanouse's 96-Footer is to be started in the Fall for delivery in 1913, Another demonstration of satisfaction. Every customer a satisfied customer. ASK ANY OWNER.

HE MATTHEWS BOAT COMPANY (CRUISING YACHTS OF QUALITY) PORT CLINTON, OHIO

Sterling

THE ENGINE of REFINEMENT

For the finest boats that float

Sterlings Again Win Opening Speed Events In The South

"Jane S.," the 32-ft. boat owned by Chas. S. Smiley, with a six-cylinder 45-65 H. P. STERLING engine, captures both 50-mile free-for-all races in the opening speed events of the season, ***Winning the 1912 Southern Championship*** at St. Augustine, Fla.

She also takes 4 first prizes and 2 second prizes during the three-day regatta.

This is the engine that drives the "Dixie Junior," 20-ft. hydroplanes at a guaranteed speed of 35 miles per hour.

"Diana," with a 100 H. P. STERLING engine, defeats the fastest boats in the 32-foot class.

ENDURANCE COUNTS

That's why STERLINGS have always made good. That's why they won the Southern races in 1909, 1910, 1911 and 1912. They have the ENDURANCE and POWER built into them.

This most valuable asset coupled with STERLING Service to all owners is the logical reason why **YOU should own a STERLING.**

Successful boats with STERLING engines are not counted by one, two or three, but by HUNDREDS. What's the answer? Think it over!!

Sterling Engine Company

1254 Niagara Street, BUFFALO, N. Y.

DEALERS

NEW YORK—Bruns Kimball Co., 132 Liberty St.
CHICAGO—Chicago Boat & Engine Co., 1508 Mich. Ave.
BOSTON—A. P. Homer, 156 State St.
PHILADELPHIA—J. J. Farley, Bourse Bldg.
ST. LOUIS—Grant C. Marsh, 6800 S. Levee.
BALTIMORE—Unger & Mahon, 119-121 E. York St.
SEATTLE, WASH.—Racine Boat & Auto Co.
HOUSTON, TEX.—Barden Electric & Machinery Co.
TACOMA, WASH.—Nickerson, MacFarlane Mchy. Co.
VANCOUVER, B. C.—Hoffar Motor Boat Co.

STERLING WINNERS IN FLORIDA

1909

Courier, - - Wins speed record trial and 119-Mile Endurance Race.
Messenger, - Finishes second in 119-Mile Endurance Race.

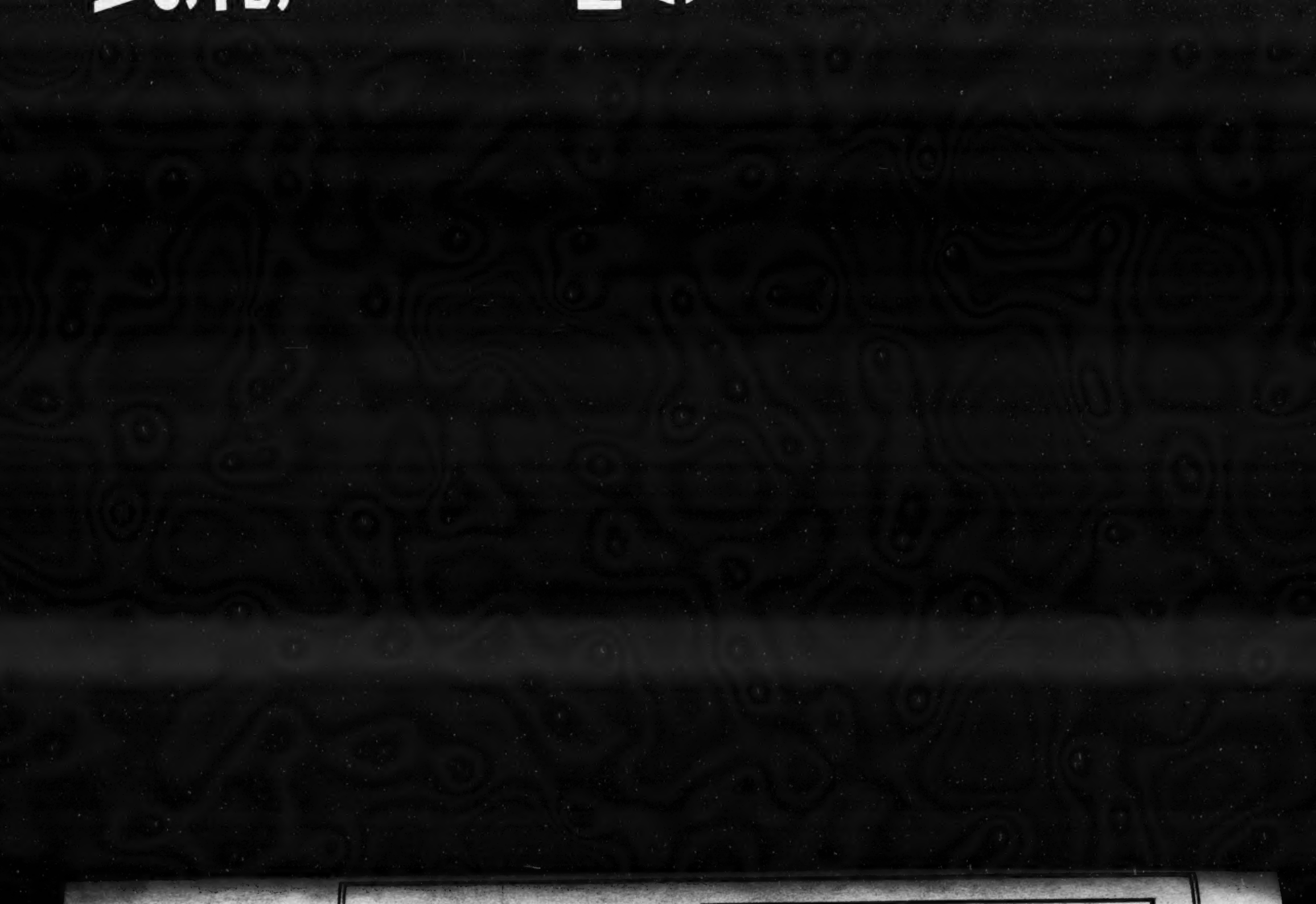
1910

Courier, - - Makes fastest time over Palm Beach course and wins speed record trial.
Dewey, - - Wins 119-Mile Endurance Race.

1911

Out of 13 events, 11 were won by Sterling powered boats, 22 entries.

Ace II, - - Wins speed record trial, breaking all records.
T. & S., - - Wins 119-Mile Endurance Race and four other events.
Ruth K., - Wins A. P. B. A. Handicap and Special Race.
Suelo, - - - Wins Class B Contest for boats under 32 feet.
Dewey, - - Wins two Class DE Races.

1912

Jane S., - - Wins two 50-Mile Endurance Races and Southern Championship, and two other events.
Diana, - - Wins speed contest for 32-footers.